JUN 14 1930

This Issue Exceeds 96,000 Copies

Medical Library

THE JOURNAL

OF THE

American Medical Association

Subscription, $7.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 94, No. 24 | 535 North Dearborn Street, CHICAGO, ILL. | JUNE 14, 1930

CONTENTS AND SUBJECT INDEX

The Specific Gravity of the Urine as a Test of Kidney Function. F. H. Lashmet, M.D., and L. H. Newburgh, M.D., Ann Arbor, Mich.1883

Newer Aspects of the Therapeutics of Viosterol (Irradiated Ergosterol). A. F. Hess, M.D.; J. M. Lewis, M.D., and Helen Rivkin, M.A., New York.....1885

Suppuration in the Paranasal Sinuses as a Factor in Focal Infection: Review of Four Hundred Cases. C. M. Anderson, M.D., Rochester, Minn. 1889

Thyrotoxicosis in Elderly Persons Without Signs of Goiter. Hugo A. Freund, M.D., and Warren B. Cooksey, M.D., Detroit.....1891

The Concentration of Antipneumococcus Serum. Lloyd D. Felton, M.D., Boston.....1893

Differential Blood Cultures. Reuben Ottenberg, M.D., New York..1896

Paroxysmal Tachycardia in Pregnancy. Jacob Meyer, M.D.; Julius E. Lackner, M.D., and Sydney S. Schochet, M.D., Chicago.....1901

Brucellosis: I. The Significance of Brucella Agglutinins in the Blood of Veterinarians. I. Forest Huddleson, D.V.M., and Howard W. Johnson, M.S., East Lansing, Mich. 1905

Incidence of Ragweed Pollen in United States During 1929. O. C. Durham, Indianapolis.....1907

The Physiologic Effects of Nonliving Testis Grafts. Carl R. Moore, Ph.D., Chicago.....1912

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Morphine in Myxedema. Edward B. Benedict, M.D., Boston.....1916

Epidemic of Dermatitis Venenata Due to a Hitherto Undescribed Cause. Frederick R. Taylor, M.D., High Point, N. C. 1916

The Occurrence of Diabetes During Pregnancy in a Woman Bearing Large Babies. Harold Bowcock, M.D., and James R. McCord, M.D., Atlanta, Ga. 1917

COUNCIL ON PHYSICAL THERAPY 1918

COUNCIL ON PHARMACY AND CHEMISTRY 1919

Committee on Foods.....1919

EDITORIALS

Metabolism During the Reproductive Cycle 1920

The Behavior of Mercury in the Body 1921

Congress Amends the Porter Narcotic Bill.....1922

Colostrum Antibodies.....1922

CURRENT COMMENT

Allergy and Brain Capacity.....1923

Accepted and Nonaccepted Viosterol Preparations 1923

(Subject Index on next page)

ASSOCIATION NEWS 1924

Entered as Second-Class Matter, June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Sec. 1103, Act of Oct. 3, 1917, authorized on June 14, 1918. If undeliverable, forwarding and return postage is guaranteed.

Copyright, 1930, by the American Medical Association. NEXT ANNUAL SESSION, DETROIT, MICH., JUNE 23-27, 1930

"An excellent . . . 'Minor Surgery'"

Says *SURGERY, GYNECOLOGY and OBSTETRICS* of CHRISTOPHER'S "MINOR SURGERY"

"It covers the scope of minor surgery after a method that parallels the plan of a well-organized text on general surgery.

"There are literally hosts of texts devoted to minor surgery. A large percentage of these are of little value.

"Christopher has given us an excellent book on minor surgery. It is beautifully written; the text is profusely and well illustrated. It should be of particular value to the man in the community remote from the hospital centers where he cannot easily obtain advice and consultation on many of the so-called 'minor,' but important, surgical lesions."

Octavo volume of 694 pages, with over 600 illustrations on 465 figures. By FREDERICK CHRISTOPHER, M.D., F.A.C.S., Associate in Surgery, Northwestern University Medical School, Chicago. With a Foreword by ALLEN B. KANAVEL, M.D., F.A.C.S., Professor of Surgery, Northwestern University Medical School. Cloth, $8.00 net

See SAUNDERS' ADVERTISEMENT on PAGES 3, 4, 5

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "MI," Medicolegal; "ME," Medical Economics.

A. M. A. Detroit Session news....1924
Abdomen wall, implantation malignancy..ab-1956
Allergy and brain capacity....E-1923
Anemia, secondary, marrow given in....ab1962
Arsenic neuritis....1940
Artery, coronary disease vs. syphilis....ab-1946
coronary, sclerosis and occlusion....ab-1945
Association of American Physicians....1945
Association News....1924
Asthma, Hunt's acetonitrile test in....ab-1963
pulmonary tuberculosis and....ab-1954
roentgen treatment....ab-1964

Bacillemia in leprosy....1932
Bacteria, differential blood cultures....*1896
Bile Ducts, extrahepatic, surgery....ab-1962
Blood cultures, differential....*1896
peritoneal absorption of....1939
pressure, high, salt-poor diet in....C-1937
sugar, determination....ab-1963
Bone graft, hinged....ab-1957
Book Notices....1941
Books Received....Adv. page 34
Brain capacity and allergy....E-1923
Breast, lesion common to....ab-1957
Bronchus, new growths....ab-1949
Brucellosis....*1905
Bureau of Investigation....1936

Cancer in children....ab-1953
Brooklyn Cancer Radium Research Institute....1925
mechanical and infective conditions..ab-1957
radiation therapy....ab-1957
radium vs. roentgen therapy....ab-1956
Castration vs. nonliving testis grafts....*1912
Cells, metabolism vs. radiations....ab-1964
living, oxygen reduction in....1934
Charcoal treatment, intra-uterine....ab-1956
Children welfare, Italy....1930
Cholecystogastrostomy....ab-1958
Cod Liver Oil, Upjohn's fortified....1939
Colon, simple, nonspecific ulcer....ab-1956
Colostrum antibodies....E-1922
Committee on Foods....1919
Compensation: witness, expert....MI-1943
Constipation, chronic, habitual....ab-1962
yeast beneficial in....1939
Contracture, Volkmann's, bone shortening for....ab-1960
Correspondence....1937
Costa Reaction....ab-1954
Council on Pharmacy and Chemistry....1919
Council on Physical Therapy....1918

Damages claimed for discrediting....1932
Deaths....1935
Delinquents, moral, reeducation....1934
Dermatitis venenata....*1916
Diabetes Mellitus, controlling....ab-1954
chewing tobacco as source of sugar..ab-1954
in pregnancy....*1917
juvenile, hereditary character....ab-1964
Diphtheria, immunization, Italy....1930
Dog, female, spaying of....1938
Dormitory, Rockefeller, gift for, Paris....1929
Duodenum, diverticulosis....ab-1957

Edema, unilateral, in infant....ab-1952
Elbow, tuberculous, tumor after roentgen therapy....ab-1961
Elephantiasis, surgery....ab-1960
Embolism, infective factor in....ab-1956
pulmonary, surgery of....ab-1956
Endometritis, puerperal, charcoal treatment....ab-1956
Enzymes, digestive, omitted from N. N. R.1919
Epithelioma, radium and roentgen therapy....ab-1956
Erythema brucellum....*1905
Erythrocytes, normal number in blood..ab-1964
Ethylene glycol, possible death from drinking....1940

Flexner, Abraham, to head Institute for Advanced Study....1927
Food, concentrated, use in gastric distress..1939
Foreign Letters....1928

Goiter, exophthalmic, roentgen treatment.ab-1964
Growth, increased by wheat germ....ab-1952

Health bill, Roumanian, new....1932
Heart, decortication for pericarditis....ab-1948
clinic at University of Chicago....1925
disease, chronic, electrocardiogram....ab-1946
disease, surgical risk in....ab-1948
muscle, ischemia....ab-1946
sound, first, intensity of....ab-1948
Hemiplegia, syphilitic, early....1931
Hernia, congenital umbilical....ab-1961
Hip lesions, iodized oil diagnosis....ab-1956
Horse hair as suture material....ab-1961
Hospitals, 21 million for, New York City..1925
Hydronephrosis, resorption in....ab-1960
Hypothyroidism, morphine relation to....*1916

Illegitimate children, aid....1930
Impotence, tests....1940
Industrial Medicine....1934
Infants, feeding....1930
mortality, decline, Illinois....1924
mortality, study....1928
Infections, focal, in tuberculous....ab-1954
focal, vs. paranasal sinuses suppuration.*1889
Inhalators for resuscitation....1938
Institute for Advance Study....1927
Internal Medicine, graduate course in....1927
International Congress for Sex Research..1929
Intestines, ileus from sauerkraut....ab-1963
no antiseptics for....1939
prolapse....ab-1956
thrombus, pathway of travel....ab-1962
tuberculosis, cod liver oil and tomato juice for....ab-1953

Johns Hopkins, department for medical history....1925

Kidney, aberrant vessels of....ab-1964
function test, urine specific gravity....*1883
Knee, lesions, iodized oil diagnosis....ab-1956

Labor, dry....ab-1953
Lactation, metabolism during....E-1920
Larynx tuberculosis, sanatorium treatment....ab-1957
tuberculosis, trichloracetic acid for....ab-1953
Leprosy, bacillemia in....1932
Licensure, Roumanian bill....1932
Liver, gumma....ab-1950
changes in hyperthyroidism....ab-1950
therapy, investigation....ab-1961
Lung, abscess, etiology....ab-1950
cancer with tuberculosis....ab-1949
new growths of....ab-1949

Malpractice: foreign bodies, gauze....MI-1944
foreign bodies, needles....MI-1944
nurses, liability of operating surgeon for....MI-1944
Marriages....1935
Maternal welfare, Italy....1930
Measles, 110 F. temperature in....ab-1957
Medical Education, Registration....1941
Medicolegal....1943
Medicine, general, and its subdivisions..ab-1945
Meed Viosterol Tablets....E-1923
Meetings, Coming Meetings....1945
Men of last ice age in Europe....1928
Meningitis, prompt recovery....ab-1951
Mental Diseases, intra-abdominal disorders....ab-1963
Mental growth and physical education....1929
Mercury, behavior of, in body....E-1921
Metabolism during reproductive cycle...E-1920
basal, determination....1940
Methyl Alcohol, drastic orders, Roumania..1932
Milk acidified with lemon juice....ab-1952
Morphine in myxedema....*1916
Myositis ossificans, circumscribed cystic.ab-1960
Myxedema, morphine in....*1916

Narcotics, limitation of production....1928
National Research Council, new funds for.1927
Nerve trunks, alcohol moistening....ab-1963
Neuralgia, trifacial, alcohol baths of carotid....ab-1963
Neuritis, arsenic....1940
Neurosyphilis, treatment....1938
News....1924
Nose, accessory sinuses, suppuration....*1889

Old Age, thyrotoxicosis in....*1891
Omentum, absorption by....ab-1955
Osteosynthesis with absorbable material..ab-1961

Pancreas cysts, diagnosis....ab-1958
hemorrhagic necrosis of....ab-1963
Parathyroid, bone changes in hyperparathyroidism....ab-1955
Pellagra, dried brewer's yeast for....ab-1955
Pelvis, postconception irradiation....ab-1956
disorders, presacral nerve resected in.ab-1959
Peptic Ulcer and anaphylaxis....ab-1959
perforated, excision and pyloroplasty for....ab-1958
Pericarditis, adhesive, decortication for.ab-1948
Peritoneum, adhesions....ab-1961
Peritonitis in mental diseases....ab-1963
Petrolatum, intra-articular injection....ab-1964
Philadelphia Pediatric Society, prize....1926
Physical Education and cerebral development....1929
Physical Therapy equipment, statement to manufacturers....1918
regulations on, Italy....1929
Physicians, surplus, France....1929
Placenta praevia, hemorrhage, low cesarean section in....ab-1959
Pneumococcus, antiserum, concentration..*1893
Pneumonia, digitalis therapy in....ab-1950
Pneumothorax, artificial, calcium chloride prevents pleural effusion in....ab-1953
Poliomyelitis, sudden rise, California....1934
Pollen, ragweed, incidence....*1907
Porter Narcotic Bill, Congress amends...E-1922
Pregnancy, diabetes during....*1917
extra-uterine, rupture....ab-1959
metabolism during....E-1920
paroxysmal tachycardia in....*1901
tuberculosis and....ab-1953
Prestone, possible death from drinking....1940
Prostate, echinococcus infestation....ab-1960
enlarged, and urinary retention....1940
lesion common to....ab-1957
Prostatectomy, circulatory complications.ab-1956
Psittacosis, bacteriology....ab-1962
stricter measures against, Germany....1934
Psychiatric Institute, intercommunal, Brussels....1934

Queries and Minor Notes....1938
Quincke's Disease, periodic swellings....1940

Rabbits, dermatitis venenata from dressing.*1916
Radio Program....1924
Ragweed pollen in U. S....*1907
Raynaud's Disease....ab-1951
Rectum cancer, radium for....ab-1957
Resuscitation, inhalators for....1938
Rickets, effect of winter sunshine through celoglass....ab-1952
developing in child on S. M. A.....1939
treatment, viosterol....*1885
Riley's Tablets (Viosterol)....E-1923
Rosenow's address on focal infection....1933
Ross Institute, report....1928

Schaudinn ceremonies....1934
Skin troubles, yeast in....1939
Society Proceedings....1945
Sphenoidal Sinus, drainage technic....1932
Spine, spondylitis on basis of abortus infection....ab-1964
State Board Examinations....1941
Steuer Prize, awarded....1926
Stomach ptosis, surgery for....ab-1961
secretion vs. vagus resection....ab-1960
Sulphur refining, dangers....1939
Summer camps for children, Italy....1930
Sutures, horse hair....ab-1961
Sweating, insensible, in infancy....ab-1951
in man, significance....ab-1958
Sympathicotonia in childhood vs. pilocarpine....ab-1952
Syphilis, cellular reaction in....ab-1950
factor in coronary artery disease....ab-1946
treatment, agranulocytosis during....ab-1958
Syringomyelia: roentgenotherapy....ab-1959

Tabes Dorsalis, optic atrophy in....1940
Tachycardia, paroxysmal, in pregnancy..*1901
Testis grafts, nonliving, effects....*1912
Thrombosis, coronary....ab-1945
infective factor in....ab-1956
Thrombus of iliac vein in left external iliac artery....ab-1958
Thyroid, malignant struma: radium for.ab-1964
thyroxin and....1933
Thyrotoxicosis in elderly persons....*1891
Tibia, fractures....ab-1958
Tonics and Sedatives....Adv. page 28
Trachoma in schools, Italy....1931
Tuberculin reaction vs. skin circulation..ab-1954
Tuberculosis, closed, in children....ab-1954
campaign against, New York City....1925
crusade against, Italy....1930
decreases, Tennessee....1926
focal infections simulating....ab-1954
immunization, B C G, deaths after....1933
pregnancy and....ab-1953
pulmonary, and asthma....ab-1954
pulmonary, Costa reaction....ab-1954
pulmonary, with lung cancer....ab-1949
Tumors from irritation and trauma....ab-1960
malignant, pathogenesis....ab-1957
malignant, serodiagnosis, prize for....1930
Typhoid, vaccination....1930
Ultraviolet Rays lamps sold to public....1918

Undulant Fever, differentiated from brucellosis....*1905
from goat's milk?....1939
University of Kansas extension course....1925
Ureter calculi....ab-1962
Urinary infections, increasing urine acidity in....ab-1961
Urine, specific gravity....*1883
retention and prostatic hypertrophy....1940
Uterus cancer, treatment....ab-1952
endocervicitis, cautery for....ab-1953

Veterinarians, brucella agglutinins in....*1905
Viosterol, therapeutics....*1885
preparations, accepted and nonaccepted.E-1823

Wheat Germ, increases growth....ab-1952
Wound healing, x-rays accelerate....ab-1964

Yeast, Therapeutic value....1939; ab-1955

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 94, No. 24 CHICAGO, ILLINOIS JUNE 14, 1930

THE SPECIFIC GRAVITY OF THE URINE AS A TEST OF KIDNEY FUNCTION *

F. H. LASHMET, M.D.
AND
L. H. NEWBURGH, M.D.
ANN ARBOR, MICH.

There are many tests of kidney function. Some of them are fundamentally unsound because the kidneys are not working to their fullest capacity at the time of the test. The most commonly used test belonging in this category is the estimation of the blood nonprotein nitrogen. Addis [1] has shown that the activity of 50 per cent of the kidneys is sufficient to remove the nitrogenous wastes at the normal rate. It follows that the nonprotein nitrogen of the blood will not be elevated until the disease has destroyed at least a half of the kidneys. The test is, accordingly, inadequate at the time when it is most needed.

In order to obtain the information desired earlier in the disease, Addis [2] proposed to put the kidneys under a maximal strain by giving large doses of urea and by forcing fluids. By comparing the ratio of urea in a one hour specimen of urine with the urea in 100 cc. of blood, he believes one can estimate the amount of functioning kidney tissue.

More recently, Van Slyke [3] found "a decrease in the volume of blood cleared of urea per unit of time" in patients with nephritis. On the basis of this he calculated the amount of functioning kidney tissue. His data compare closely with the results obtained by Addis.

Both these tests seek to estimate kidney function by using the quantitative capacity of the kidneys to eliminate one substance; namely, urea. There are two objections to these tests. First, the kidneys eliminate many other substances besides urea. In disease, the kidneys may be better able to eliminate one substance than another. In one type of nephritis certain electrolytes may be retained, while in another type nitrogenous products may be held back. In the tests of Addis and Van Slyke the assumption is made that the ability of the kidneys to eliminate urea is an adequate measure of the total functional capacity of these organs. There is no evidence at present to support this assumption.

Second, and of lesser importance, is the fact that both these tests demand elaborate facilities and a trained technician. Consequently, neither is frequently applied.

Because of these objections, we have sought a test which would give more accurate information than the commonly used tests of kidney function and which would be easy to perform. We will discuss an old and simple method which has been modified by us and which, with our modification, appears to give valuable information.

The function of the kidneys is to excrete solids in solution; that is, to make urine. Long [4] has pointed out that the specific gravity of the urine is a fairly accurate measure of the solids in solution. Consequently, it follows that, if the kidneys are pushed to their utmost capacity, the specific gravity of the urine ought then to be a measure of the ability of the kidneys to excrete solids. These solids include not only urea but all the substances excreted by the kidneys. Consequently, the total capacity of the kidneys is measured and not the capacity to eliminate urea alone.

Hedinger and Schlayer [5] were the first to employ this principle. Strain was placed on the kidneys by using a definite diet and restricting fluids for twenty-four hours. It was found, as was to be expected, that normal kidneys produced a urine with high specific gravity and abnormal ones did not.

Mosenthal [6] revived the test in this country and modified it to meet the American diet. Christian,[7] Foster [8] and many others have used the test with slight modifications. They have frequently made a plea for the use of this method because it is simple and because more complicated tests give no more information.

These observers did not include a preliminary period of preparation of the patient. Further, food and a limited amount of fluid were allowed.

In order to obtain the greatest information regarding the rate at which the kidneys remove waste products, one should arrange the test so that precisely the same amounts and kinds of these products are presented to the kidneys in a unit of time. This ideal would be attained if all the subjects had the same total metabolism and if they had been ingesting identical diets for a number of days. This ideal may be approximated by feeding the same standard diet for three days prior to the test and by keeping the patients in bed throughout these days. Further, it is clear that, in order to obtain a proper basis for comparison of the functional ability of the kidneys to eliminate wastes, it is necessary that

* From the Department of Internal Medicine, University of Michigan Medical School.

1. Addis, Thomas; and Watanabe, C. K.: J. Biol. Chem. **28**: 251 (Dec.) 1916.
2. Addis, Thomas: Renal Function and the Amount of Functioning Tissue, Arch. Int. Med. **30**: 378 (Sept.) 1922.
3. Moller, E.; McIntosh, J. F., and Van Slyke, D. D.: J. Clin. Investigation **6**: 427 (Dec.) 1928.
4. Long, J. H.: J. Am. Chem. Soc. **25**: 871, 1903.
5. Hedinger and Schlayer: Deutsches Arch. f. klin. Med. **114**: 120, 1914.
6. Mosenthal, H. O.: Renal Function as Measured by the Elimination of Fluids, Salt and Nitrogen, and the Specific Gravity of the Urine, Arch. Int. Med. **16**: 733 (Nov.) 1915.
7. Christian, H. A.: Oxford Medicine, vol. 1, chapter 16, p. 687.
8. Foster, N. B.: New York State J. Med. **26**: 674 (Aug.) 1926.

these organs be working at a fixed rate. Such a rate is attained when these organs are forced to work at their maximal capacity.

If the individual is deprived of drinking water and food, which is also a source of water, less and less water will be available for urine. Consequently, solids will be removed in greater and greater concentration until a maximum is reached.

TABLE 1.—*Actual Foods and Amounts Used During Period of Preliminary Preparation* *

Breakfast	Grams	Approximate Equivalent
Fruit (13%) oranges	100	1 orange 2½ inches in diameter
Cornflakes	20	⅔ cupful
Bread (or toast)	60	2 slices
Butter	15	1 level tablespoonful
Cream (20%; coffee cream)	100	½ cupful
Sugar	15	1 level tablespoonful
Dinner		
Potato	100	1 medium size, 2½ inches in diameter
Asparagus or tomatoes, stewed	100	½ cupful
Lettuce salad with vinegar	100	¼ head plus 2 leaves
Pineapple, canned	100	½ cupful, sliced
Milk	200	1 glass
Bread	30	1 slice
Butter	25	2 level tablespoonfuls
Cream (20%; coffee cream)	40	3 scant tablespoonfuls
Supper		
Egg	1	
Potato, baked	100	1 medium size, 2½ inches in diameter
Spinach, cooked	100	½ cupful
Salad, raw carrots grated with Celery, and French dressing	100	½ cupful, grated carrots and 2 stalks celery (1½ level tablespoonfuls
Butter	20	1½ level tablespoonfuls
Bread	30	1 slice
Peaches	100	1 large half with 1 tablespoonful of juice
Cream (20%; coffee cream)	60	4 level tablespoonfuls

* These foods must be eaten daily for three days. It is important that all the food listed be eaten. In addition, a glass of water may be taken with each meal and a glass between each meal.

In devising a test we have accordingly proceeded as follows: The period of preliminary preparation lasts three days, during which time the patient is confined to bed and receives a standard diet. This diet consists of protein 45 Gm., fat 106 Gm., and carbohydrate 180 Gm., the number of calories being about 2,000 and the sodium chloride intake from 2 to 3 Gm. daily. The average fluid intake is limited to about 1,500 cc. daily. A menu based on this diet is given in table 1.

The period of the actual test begins on the third day of preparation. At 6 p. m. of this day, after the patient has had supper, all intake, both food and fluid, is entirely stopped until noon the following day. All urine is discarded except as follows: At 10 a. m. the bladder is emptied and this urine is discarded. The specimen for examination is obtained by emptying the bladder again promptly at noon. After this specimen has been obtained, the test is completed as far as the patient is concerned and eating and drinking may be resumed.

The specific gravity of the specimen is then determined. We enploy the pyknometer for this purpose. Since some of the urine is placed in the chamber of the instrument, which is then floated in distilled water, the interfering effect of temperature on specific gravity is avoided merely by having the urine and the water at the same temperature.[9]

Since specific gravity is dependent on the amount of material in solution and since albumin, when present in the urine, is in solution, it will raise the specific gravity in proportion to its concentration. Albumin is not a part of the normal waste; hence, it is necessary to discount its effect on the specific gravity that is being used to measure the ability of the kidneys to remove waste. Accordingly, it is necessary to make a correction when albuminuria exists. In order to learn the effect of protein on specific gravity, a series of solutions of pure egg albumin ranging from 0.25 to 3 per cent were made and their gravities obtained by means of the pyknometer. The accompanying chart shows that the effect of less than 0.5 per cent of albumin may be neglected. On the other hand, 2 per cent of albumin will raise the specific gravity more than 7.[7] With such a chart, only the percentage of albumin in a sample of urine is needed in order to make correction for its presence. Folin[10] prepared a 0.1 per cent solution of albumin by mixing appropriate amounts of sheep serum with a 15.0 per cent chloride solution. One cubic centimeter of it mixed with 24 cc. of a 2 per cent sulphosalicylic acid solution produces a fine suspension. This cloud has been used as a standard to determine the amount of albumin in 1 cc. of urine treated in the same manner.[11] Table 2 shows several cases in which a correction was made for albuminuria in this manner.

One hundred and twenty cases were studied. The patients were classified as having normal or abnormal kidneys according to the following criteria: Those who were normal showed no evidence in the history or physical examination of nephritis; the urine was normal, and there was a phenolsulphonphthalein excretion of 50 per cent or above in two hours, and a blood nonprotein nitrogen of 40 mg. per hundred cubic centimeters or less.

The controls were hospital patients in whom no evidence of any organic disease was found and who were normal according to these criteria. There were twenty-five such cases.

The abnormal patients were those suspected of having kidney disease because of albumin in the urine.

TABLE 2.—*Results of Specific Gravity Determinations Corrected for Albuminuria*

Case	Albuminuria, per Cent	Specific Gravity	
		Uncorrected	Corrected
127	2.7	1.025	1.015
116	2.5	1.019	1.010
120	2.5	1.025	1.016
118	1.5	1.022	1.016
124	1.0	1.020	1.016
123	1.0	1.016	1.012
125	1.0	1.016	1.012
117	1.0	1.014	1.010
126	0.40	1.012	1.010
128	0.15	1.020	1.020
122	0.10	1.021	1.021
129	0.10	1.016	1.016

In addition, many had other evidence of nephritis either in the history or in the physical examination, or because of a low phenolsulphonphthalein test, a high blood nonprotein nitrogen, or both. There were ninety-five such cases.

In the twenty-five normal cases the concentration of the urine reached a specific gravity of 1.026 or above.

9. The particular type of pyknometer used was the Saxe urinopyknometer. It is accurate and requires only a few cubic centimeters of urine for a determination.

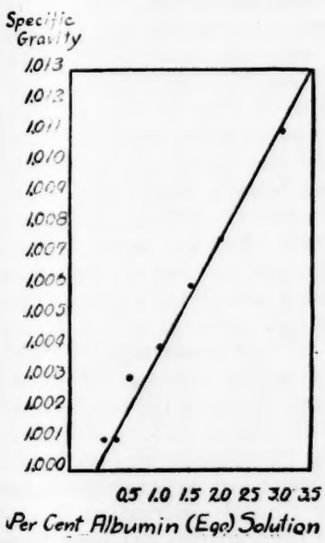
10. Folin, Otto; and Denis, W.: J. Biol. Chem. **18**: 273, 1914.

11. While this method is satisfactory, it is not convenient for the practitioner since it is necessary to have fresh sheep serum whose protein content must be determined by analysis. Such a solution is also difficult to preserve. As a substitute for the standard of Folin, the following preparation was made: To every 9 cc. of a 0.1 per cent Ivory soap solution, 1 cc. of a 0.035 per cent aluminum ammonium sulphate solution was added. This mixture gives a turbidity which corresponds very closely to that produced by a 0.1 per cent albumin solution when prepared as described by Folin. When glass-sealed in the test tube, the turbidity remains unchanged indefinitely. The materials necessary to carry out this test, including a standard ready to use for the quantitative determination of albumin, may be obtained from Eberbach & Son Company, 200 East Liberty Street, Ann Arbor, Mich.

In fact, in seventeen (68 per cent) the concentration was 1.028 or above.

Of the ninety-five patients placed in the abnormal group, the urine of ninety-one, or 95.8 per cent, failed to reach a specific gravity of 1.026. Even though in 95.8 per cent of these patients there was inability to concentrate the urine to the normal level, it is true that only 60 per cent were unable to excrete the normal amount of phenolsulphonphthalein dye and 76.9 per cent had kidneys still capable of keeping the nitrogenous wastes down to the normal level.

There were thirty-eight abnormal patients who eliminated 50 per cent or more of the phenolsulphonphthalein dye and who had a blood nonprotein nitrogen below 40 mg. per hundred cubic centimeters. In spite of the normality of these two commonly employed tests, only two of the thirty-eight patients showed an ability to concentrate the urine to a specific gravity of 1.026. In more than half of the thirty-eight the urine failed to reach a concentration of 1.020. The two patients who were able to reach a concentration above 1.025 had essential hypertension and an accompanying trivial albuminuria. It is a well known fact that the majority of patients with essential hypertension do not show serious kidney injury. Hence, in these two cases the high specific gravity is presumably added evidence of the satisfactory state of the kidneys.



Effect of protein (egg albumin) on specific gravity of a solution, showing corrections necessary in test when albuminuria exists.

Twenty-one of the abnormal patients showed a phenolsulphonphthalein dye excretion below normal and a blood nonprotein nitrogen above normal. None of these individuals showed an ability to concentrate the urine to a specific gravity of 1.021. In fact, in more than half of them the concentration failed to reach 1.016.

We have had an opportunity to apply the test to three myxedematous patients not included in this series. Even though they exhibited none of the standard signs of kidney disease, in all of them the kidneys were unable to concentrate the urine normally. Since the production of waste products in these subjects must have been slower than in normal individuals under the same conditions, it is presumably true that it took their kidneys a longer time to reach the maximal concentrating power. This idea was tested in one of these patients, whose basal metabolic rate was minus 35 per cent. At the end of the usual period allowed for concentration (eighteen hours) the specific gravity was only 1.011. However, six hours later it had reached 1.027.

SUMMARY

Tests of kidney function which depend on the retention or excretion of a single substance, such as urea or a dye, are open to the objection that there is no evidence that the kidneys excrete other waste products in the same proportion as the substances examined. As already pointed out by Addis,[2] when it is desired to measure the capacity of an organ to perform its function it is necessary to arrange the test so that the organ will be working at its maximal capacity. The test that we have described provides a standard waste to be removed by the kidney during a time when it is forced to function at its maximal capacity. The test also provides for the measurement of the total function of the kidneys under such conditions. It is therefore presumably true that it affords a better insight into the functional state of the organ than any of the tests now employed. It has been shown that the determination of the specific gravity of the urine under proper conditions detects a lowering of the functional ability of the kidneys long before this fact is discernible by means of either the phenolsulphonphthalein test or the estimation of the blood nonprotein nitrogen.

NEWER ASPECTS OF THE THERAPEUTICS OF VIOSTEROL (IRRADIATED ERGOSTEROL) *

A. F. HESS, M.D.
J. M. LEWIS, M.D.
AND
HELEN RIVKIN, M.A.
NEW YORK

In June, 1924, it was announced by Hess, and in September of the same year by Steenbock, that inert substances can be endowed with antirachitic potency by means of ultraviolet irradiation.[1] Less than two years later, Windaus and Hess [2] and Rosenheim and Webster [3] shed further light on this subject by showing that it is ergosterol which undergoes this remarkable metamorphosis. During the short period which has followed, much has been learned and the advance has been steady and significant, but this aspect of pharmacology is so novel that it is not surprising that much remains to be explored and elucidated.

As is true of nutritional disorders in general, so of rickets the most important realm of therapeutics is that of prevention. With this goal in view we attempted the absolute prevention of rickets in sixty infants, from 4 to 12 months of age, by giving, in the autumn and throughout the winter, 10 or 20 drops daily of viosterol in oil 100 D (irradiated ergosterol). These infants were in a model institution and received a diet appropriate to their ages, including orange juice in all instances, and cereal and vegetables when these were indicated. There was plenty of fresh air in the wards and the children were outdoors almost daily. As has been the practice in similar investigations that we have carried out, the progress of the infants was followed carefully throughout the winter by means of the usual clinical examinations, as well as with the aid of the newer criteria of rickets, more especially the analysis of the blood for calcium and inorganic phosphorus, and roentgenograms. The period of investigation was completed in March, before the advent of spring, and before the factor of sunlight could assume a disturbing rôle.

The result of this investigation may be summarized by the statement that the infants were well protected

* From the Department of Pathology, Columbia University College of Physicians and Surgeons.

1. Hess, A. F.: Priority as to the Activation of Foods by Ultraviolet Rays, correspondence, J. A. M. A. **94**: 1163 (April 10) 1930.
2. Windaus, A., and Hess, A. F.: Gesellsch. d. Wissensch. z. Göettingen, Math.-Phys. Klasse, 1926, p. 195; Proc. Soc. Exper. Biol. & Med. **24**: 461 (Feb.) 1927.
3. Rosenheim, O., and Webster, T. A.: J. Soc. Chem. Indust. **45**: 932, 1926.

by viosterol. If one has in mind the type of disorder that is generally recognized as rickets, it may be stated that almost complete protection was afforded by this preparation. If, however, one judges by the more refined methods of diagnosis, more especially by a degree of beading of the ribs which, in the course of our study of this disorder, we have learned to associate with rickets, it is found that protection was not absolute. On the basis of this standard and of the roentgenographic appearance, it was found that ten cases showed some evidence of mild rickets. The ages and other data in regard to these ten cases are reproduced in the accompanying table. It will be noted that in all of them beading developed in the course of the winter and that, in a few, craniotabes also was noted after viosterol had been given for a period of two months or more. As, however, the significance of craniotabes in relation to rickets is still a moot question, we shall not lay weight on this clinical sign, nor shall we, for the same reason, stress in any measure the development of bowing of the legs, which it will be noted also occurred in a few instances. Most of the ten cases failed to show rickets on roentgenologic examination; in four, however, lesions were evident although, in one instance, the diagnosis might be considered questionable. Although from a nutritional point of view this result is not perfect, it is a decided accomplishment as compared with the extent of rickets that was encountered in our institution before antirachitic measures were generally employed. It is also satisfactory when compared with the results that have been achieved by means of cod liver oil, given for prophylaxis. About thirteen years ago, in a study by Hess and Unger[4] of prophylactic therapy for infants in a Negro community, it was found that by means of cod liver oil they "were able to prevent the development of rickets in more than four fifths of the infants who received the oil for six months and in more than half of those who were given it for four months." A few years ago Wilson[5] also found that cod liver oil is not an absolute specific for rickets and that mild degrees of this disorder developed during the course of the winter in spite of this medication. As stated, in the present investigation some of the infants were given 10 drops of viosterol daily and others 20 drops. It will be noted in the table that rickets was not confined to those receiving the smaller amount.

In the report of 1928, we pointed out that, under exceptional conditions, viosterol may lead to hypercalcemia and that there may be an idiosyncrasy in this regard. In the course of the past winter, no instance of hypercalcemia has been encountered.[6] There was only one case (J. S.) in which, by mere chance, a condition which may be termed "transient hypercalcemia" was noted. This infant was found, in the course of a routine test, to have a concentration of 14.3 mg. of calcium in the blood. At this time it had an upper respiratory infection accompanied by fever. Although no change in medication was made, an analysis four days later showed, as may be seen in the table, that the calcium had fallen to the normal level of 10.9 mg. per hundred cubic centimeters of blood.

There is one point, mentioned last year, which we wish to emphasize particularly in the present report, as it has clinical significance and should be borne in mind by those who are using viosterol and especially by those who are making a study of its action. We refer to the concentration of the inorganic phosphorus of the blood in relation to rickets. It has been generally accepted that, if the concentration remains at the normal level, this fact can be taken as conclusive evidence that rickets has not developed. Analysis for inorganic phosphorus in the blood has come to be regarded as pathognomonic, very much as has that of the blood sugar in the diagnosis of diabetes. For some years we have mentioned that there are undoubted exceptions to this rule. Last year we summed up the matter in the following paragraph:[7] "It was found that when inadequate amounts of antirachitic agents, for example, of irradiated ergosterol or of irradiated dried milk, were given as preventive measures, and when rickets developed—as evinced by the roentgen and clinical examinations—concentrations of 6 mg. or more of inorganic phosphorus and of 10 mg. or more of calcium per hundred cubic centimeters, in other words normal values, were found in the blood." It was furthermore emphasized that this reaction is an early phenomenon that is "apt to occur a few weeks after the drug has been given." In the course of this year's investigation, there has not been a single instance of diminished inorganic phosphorus among the sixty infants that have been studied. In a few cases the level fell somewhat below 6 mg., but in most of the others it was nearer 7 mg. Turning once more to the accompanying table, among the ten cases in which rickets developed to some degree, we find the concentrations of inorganic phosphorus quite within the normal range; in fact, high rather than low. Even in the one instance which showed slight to moderate rickets roentgenographically, the inorganic phosphorus was high (6.5 mg.). These results emphasize our experiences of last year and constitute a new clinical observation in connection with rickets. The phenomenon has been made the subject of a recent experimental study in our laboratory, the results of which have been summarized as follows:[8]

> If milk is incorporated in a standard rickets-producing ration, a peculiar chain of circumstances can be brought about. On the addition of small amounts of irradiated ergosterol, the inorganic phosphorus is raised to the normal level without accompanying signs of healing of the rachitic lesions. Animals which receive supplements of cod liver oil do not attain as high a concentration of phosphorus but do show definite evidences of healing. Of course, if full doses of irradiated ergosterol are given, prevention or cure can be relied upon. Irradiation may elaborate a factor which increases the inorganic phosphorus in the blood, quite apart from any antirachitic action.

It is evident that a clinical corollary of this statement is that, when irradiated foods or viosterol is given, it is misleading to rely on the concentration of inorganic phosphorus in the blood for the absolute diagnosis of rickets.[9] Reliance will have to be placed on the development of well established clinical signs

4. Hess, A. F., and Unger, L. J.: Prophylactic Therapy for Infants in a Negro Community, J. A. M. A. **69**: 1583 (Nov. 10) 1917.

5. Wilson, May G.: The Prevention of Rickets, Am. J. Dis. Child. **31**: 603 (May) 1926.

6. It should be stated that the irradiation of the viosterol which we used this winter was done by means of a carbon arc lamp instead of a mercury vapor lamp, as had been the custom in previous years. It was found that viosterol in which activation had been induced in this way was less toxic to rats than the preparation which had been previously tested. For example, two years ago we were able to induce hypercalcemia as high as 15 mg. by giving young rats, for a period of six days, 3 mg. daily of activated ergosterol. This year we have been unable to induce this phenomenon although we employed even larger amounts of the newer preparation.

7. Hess, A. F.; Lewis, J. M., and Rivkin, Helen: Status of Therapeutics of Irradiated Ergosterol, J. A. M. A. **93**: 661 (Aug. 31) 1929.

8. Hess, A. F.; Weinstock, Mildred; Rivkin, Helen; and Gross, J.: J. Biol. Chem. **87**, May, 1930.

9. It also emphasizes a point that we have raised elsewhere; namely, that the fact that a normal concentration of inorganic phosphorus in the blood is not infrequently found together with craniotabes, especially in premature infants, cannot be used as evidence that this lesion is of simple osteoporotic rather than of rachitic nature.

and on the roentgenologic evidence; it is well recognized, however, that the latter is not available until the nutritional disorder has been in progress for a long period. Data such as are presented in the accompanying table show conclusively the fallacy of relying on the product of the calcium times the inorganic phosphorus concentration of the blood, either for the diagnosis of rickets or as the basis for a consideration of its pathogenesis. In all these cases there was a product of more than 40, which is supposed to be indicative of an absence of rickets. The most marked instance, showing slight to moderate rickets in the roentgenogram, presented a calcium concentration of 10.8 mg. and an inorganic phosphorus of 6.5; in other words, a product of more than 70.

At the present time it is not possible to be certain of the reason for this association of rickets with a normal titer of inorganic phosphorus in the blood. The most probable explanation would seem to be that in the course of irradiation a factor is produced which stimulates phosphatemia. As stated in our 1929 report:[7] "It will be remembered that in the course of activating ergosterol by means of ultraviolet radiations a series of products are formed; that the sterol passes through various chemical phases and that the final product is a mixture rather than a photochemical entity." This point of view has been firmly established by observations which have been reported during the past few months. By means of irradiating for varying periods and by other methods, Windaus[10] has recently been able to separate the antirachitic from the "hypercalcemia" or "toxic factor" in viosterol; the latter is far more resistant to the rays than the former. Reerink and Van Wijk[11] have also shown that short ultraviolet waves (254 millimicrons) produce two products from ergosterol almost simultaneously, one of which is vitamin D and is quickly destroyed. Longer ultraviolet waves (275 millimicrons) also produce two products, one of which is vitamin D; its destruction is so slight following irradiation with rays of this length that 60 per cent of the ergosterol can be converted into the vitamin before the second or interfering product has been formed to any great extent. The "phosphate phenomenon" which we have described is possibly a specific manifestation similar to the "calcium phenomenon."

It has become increasingly evident ever since ultraviolet rays were employed in the treatment of rickets that the methods of irradiation were crude and unsatisfactory and would have to be refined. Some years ago we suggested that extremely short rays should be filtered out in the use of direct irradiation of the body. A technic of this kind has been followed by some by employing filters that intercept most of the radiations shorter than 280 and 290 millimicrons. Similar methods will have to be made use of in connection with the irradiation of foods, in order to elaborate a more constant and uniform product. There is no doubt that viosterol, as now produced, contains a number of substances and that the antirachitic factor constitutes only one of the elaborated products. Although we are not yet in a position to determine the best technical procedure, sufficient data are already at hand to render it advisable that, when the mercury vapor lamp is used, filtered rather than unfiltered rays should be employed.

As a curative rachitic agent, viosterol must be regarded quite differently than as a preventive agent. In the first place, when given for curative purposes, rapidity of action is a most important factor. No antirachitic measure acts with greater rapidity than does viosterol if given in sufficient dosage. In this respect

Development of Rosary and Roentgenologic Evidences of Rickets Associated with Normal Concentrations of Phosphorus in the Blood

Name	Age, Mo.	Weight		Viosterol		Physical Examination*				Analyses of Blood			Roentgen Examination		Comment
		Date	Lbs.	Drops	Begun	Date	Craniotabes	Beading	Bowing	Date	Calcium, Mg.	Inorganic Phosphorus, Mg.	Date	Results	
R. B.	4	12/ 2/29	7.3	20	12/ 2/29	12/ 2/29	0	±	+	2/22/30	10.4	7.0	3/ 6/30	Slight rickets	Flat head; soft chest
		12/30/29	9			12/30/29	0	0	+						
		3/ 1/30	12			2/26/30	+	+	++						
L. B.	7	11/15/29	12.8	20	11/15/29	11/15/29	0	±	+	2/22/30	10.4	6.1			
		2/12/30	15			2/14/30	0	+±	+	3/14/30	10.0	6.4	3/ 1/30	Negative	
H. R.	4	11/20/29	7	20	11/20/29	11/20/29	0	0	+	2/26/30	10.7	6.6	3/ 1/30	Slight rickets	
		1/ 7/30	9.5			2/ 7/30	+	0	0						
		2/26/30	13			2/26/30	+	±	+						
						3/ 8/30	±	+							
B. W.	7	12/16/29	13.1	20	12/16/29	12/16/29	+	0	+	2/26/30	10.8	6.5	3/ 1/30	Slight to moderate rickets	Six teaspoonfuls of cod liver oil given daily from 3/4/30 to 3/25/30
						2/14/30	0	+	+±				3/14/30	Slight healing	
													3/25/30	Complete healing	
C. L.	5	1/24/29	5.7	20	1/21/30	12/24/29	0	0	0	3/ 5/30	10.8	6.8	3/ 6/30	Slight rickets	
		2/25/30	9.6			2/25/30	+	+	+						
A. L.	11	12/10/29	14.5	20	12/10/29	12/10/29	0	0	0	3/ 5/30	9.9	6.9	3/13/30	Negative	
		2/17/30	17.3			2/17/30	0	+	+						
J. C.	10	7/22/29	7.6	10	10/19/29	7/22/29	0	+±	+	3/ 5/30	....	6.9	3/ 7/30	Negative	
		1/17/30	15.5			1/17/30	0	0	+						
		2/14/30	16.4			2/14/30	0	+	+						
						3/ 8/30		+							
J. S.	11	8/ 1/29	11	10	10/17/29	8/ 1/29	0	0	0	3/13/30	14.3	6.7	.....	Slight hypercalcification	Upper respiratory infection from 3/10/30 to 3/13/30; transient hypercalcemia
		3/15/30	19			2/14/30	0	+	+±	3/18/30	10.9	5.3	3/21/30		
						3/15/30	0	+	+±						
F. D.	4	2/ 4/30	6	20	2/ 4/30	2/ 4/30	0	0	+±	3/ 7/30	10.3	6.4	3/14/30	Negative	
		3/ 8/30	8.5			3/ 8/30	+	+±	+±						
B. F.	4	2/ 4/30	8	20	2/ 4/30	2/ 4/30	0	0	+	3/ 8/30	10.6	6.5	3/14/30	Negative	
		3/ 8/30	10			3/ 8/30	0	+	+						

* In this column, ± does not indicate rickets; + or more does indicate rickets.

10. Windaus, A.: Gesellsch. d. Wissensch. z. Goettingen, Math.-Phys. Klasse, 1930, p. 36.
11. Reerink, E. H., and Van Wijk, A.: Biochem. J. **23**: 1294, 1929.

it far exceeds the action of cod liver oil. The healing of the rachitic lesion at the epiphyses and of the softening of the cranial bones is often evident after viosterol has been given for less than a fortnight. Furthermore, when active rickets is present, there is no danger whatever of inducing hypercalcemia, so that large doses of the drug may be used. Hypercalcemia has developed only when viosterol has been given to normal infants, and in these instances only under exceptional circumstances and generally when the dosage has been excessive. It may be added that, in rats which are suffering from rickets, hypercalcemia can be brought about only with the greatest difficulty; even as large doses as 5 mg. daily may be given for several days without raising the calcium above the normal level. The only cases that do not respond readily to viosterol are the anomalous cases of rickets which have been termed "renal rickets"; in these instances viosterol has little or no value. We may add that we have recently seen an instance of what may be termed "diabetic rickets," which likewise showed an exceptional resistance to this form of medication. This type of endogenous rickets is exceedingly rare; we have encountered only three cases in the course of a clinical experience of many years.

STANDARDIZATION AND DOSAGE

Before the dosage of viosterol is considered, the question of standardization must be discussed. In the paper of two years ago it was brought out that dosage cannot be based on the number of milligrams or fractions of a milligram that are given. Preparations of irradiated ergosterol differ so widely that a milligram of one may be equivalent in potency to many milligrams of another. The experiments that have been cited in regard to the various chemical changes brought about in ergosterol by radiations of different wavelengths tend to emphasize this point of view still more strongly. Of late the gravimetric method of computing dosage has been abandoned, not only in the United States but in Germany and elsewhere. In this country a uniform method of standardization has been adopted which is based on a comparison of the potency of viosterol with cod liver oil. The standard viosterol solution is stated to be 100 times more potent than high grade cod liver oil. This method has been worked out by a comparison of the potencies of these two antirachitic agents in their curative action on rats. A method of this kind postulates that the activity of viosterol and of cod liver oil is the same in infants as in rats. As a matter of fact, recent clinical observations, of which we have made a preliminary report,[12] have shown that such an assumption does not accord with the facts. As stated, it was found that 20 drops of viosterol failed in some instances to give infants full protection from rickets. Now, according to the biologic test, 20 drops of viosterol in oil 100 D is equivalent to 10 teaspoonfuls of high grade cod liver oil. Such an amount of cod liver oil can rarely be given to an infant; the customary dose is about 3 teaspoonfuls a day. From past experience we believe that we should not have encountered so many cases of incomplete protection had we given these children 10 teaspoonfuls daily of cod liver oil—in other words, the presupposed equivalent of 20 drops of viosterol. A case presented itself which allowed us to put this supposition to the test. A well nourished infant (B. W.), aged 7 months, developed slight to moderate rickets, as evidenced by the roentgen rays, although it had received 20 drops of viosterol daily from December 16 to March 3. From March 4 six teaspoonfuls daily of cod liver oil was given this infant. Ten days later slight healing of the wrist was evident roentgenographically, and after a total period of three weeks signs of complete healing were evident. In other words, six teaspoonfuls of cod liver oil had accomplished what 20 drops of viosterol (the supposed equivalent of 10 teaspoonfuls of cod liver oil) had failed to do. An experience of this kind does not mean that cod liver oil is superior to viosterol or that the action of the latter is unreliable, but it does indicate that the comparative potency in infants is not what it is supposed to be and therefore that the present method of standardization, which is based and computed on this relationship, must be changed.

When it is borne in mind that there is an essential difference in the pathogenesis of rickets in the rat and in infants, that the former is regularly brought about simply by a lack of phosphorus in the diet, whereas rickets never comes about in infants as the result of such a deficiency, it is not surprising that there should be a difference in their response to antirachitic agents. There has been a tendency to lose sight of the fact that rickets in the rat, although of great experimental value, is not the exact counterpart of infantile rickets. A distinction in the reaction to viosterol and to cod liver oil between the infant and the rat was to be expected, and it became inevitable when it developed that the former had specific phosphate raising properties not possessed by the latter. In this connection it should be mentioned that recently Barnes and his co-workers[13] reported that they had found that viosterol was not as efficacious in protecting infants against rickets as an equivalent potency of cod liver oil; it should be added, however, that in these tests 10 per cent less of viosterol was given than of cod liver oil.

Instead of expressing potency in terms of cod liver oil, it would seem best to express it directly in terms of protective or curative rat units. A certain number of drops of viosterol represents so many hundred or thousand units. This is the method which at present is being followed in Germany, some laboratories using prophylactic and others curative tests. In our experience, there is not much distinction between the potency of an antirachitic agent which is needed to protect or to cure rats. A few years ago, when assaying the potency of puffer fish oil, we found this oil to be sixteen times as potent as cod liver oil when tested by the prophylactic method; at the same time workers in another laboratory carried out tests by means of the curative method and reported exactly the same potency.

In our paper of 1929 we suggested about 10 drops daily of viosterol as a prophylactic dose for an infant growing at the normal rate. In view of our experiences during the past year, it would seem that this dosage should be increased to about 30 drops a day. There is no danger in this increased amount. Premature infants must be considered as a separate group and will require extra amounts in order to be protected. Instead of giving such a large number of drops, the potency of the viosterol solution might well be increased to from two and a half to three times its present strength, so that the dosage could still be maintained at 10 drops a day. The German preparations of viosterol are about three times as potent as viosterol in oil 100 D.

12. Hess, A. F.; Weinstock, Mildred; and Rivkin, Helen: Proc. Soc. Exper. Biol. & Med. **27**, April, 1930.

13. Barnes, D. J.; Brady, M. G., and James, E. M.: The Comparative Value of Irradiated Ergosterol and Cod Liver Oil as a Prophylactic Antirachitic Agent When Given in Equivalent Dosage According to Rat Units of Vitamin D, Am. J. Dis. Child. **39**: 45 (Jan.) 1930.

Forty-five drops or its equivalent (15 drops of the stronger preparation) should be used to cure the ordinary case, but in severe cases of rickets greater amounts should be given according to their severity. The number of drops may be left to the judgment of the physician, as there is little danger of giving too much.

We shall not consider in detail the various other antirachitic agents which are being used or recommended at the present time. It should be added, however, that in view of what we have stated in regard to an increase in the dosage of viosterol, it will be necessary to modify the potency of "fortified" cod liver oil. At present this preparation is labeled 5 D, as it is supposed to be five times as potent as cod liver oil; it contains the equivalent of 10 drops of viosterol per teaspoonful. It would seem advisable to increase this supplement to 20 drops, to label it 10 D rather than 5 D, and to give the same amount.

In connection with the value or dosage of irradiated yeast or of irradiated milk, we would point out what we have emphasized in regard to the irradiation of ergosterol; namely, that present methods of activation are not satisfactory and that we must have a more definite knowledge of the intensity and of the range of radiations to which these substances are subjected. In regard to irradiated cereal we can merely repeat what was stated last year:[7]

> Irradiated cereals can play little or no rôle in the eradication of rickets. Rickets is a disorder of the first year of life and during this period such small amounts of irradiated cereals can be fed as to render them inconsequent from a therapeutic point of view. Such a food may be regarded as an adjuvant to other antirachitic measures, and perhaps of value in later childhood when the requirement of antirachitic factor has become greatly reduced.

SUMMARY AND CONCLUSIONS

In the course of a test of a large number of infants it was found that although viosterol, in its present dosage, conferred protection against rickets, some evidences of this disorder were apparent in a small number of cases. No hypercalcemia or other untoward symptoms developed.

The cases that showed signs of mild rickets were remarkable for the fact that the inorganic phosphorus of the blood was maintained at its normal concentration; in no instance did the phosphorus fall below the normal level. This peculiar manifestation—rickets associated with undiminished inorganic phosphorus—was noted last year when irradiated milk was given. It was brought about also in animals by feeding inadequate amounts of viosterol.

A clinical experience of this kind indicates that an analysis of the blood for inorganic phosphorus may be misleading and that, when viosterol is being given, the presence of rickets will have to be determined by clinical signs and the roentgenogram. It shows also not merely that rickets is a systemic disease but that local factors may play a determining rôle in calcification at the epiphyses. Furthermore, it emphasizes the fact that the product of the calcium times the phosphorus concentration in the blood is not a reliable indicator as to whether or not active rickets is present.

The present method of irradiation of ergosterol possibly elaborates a factor which increases the inorganic phosphorus in the blood, quite apart from any antirachitic action.

Viosterol is a remarkable curative agent for rickets. It is absolutely reliable, very rapid in its action, and never associated with the development of hypercalcemia.

The present method of standardizing viosterol on the basis of "cod liver oil units" is founded on the false premise that the action of cod liver oil and of viosterol is the same in infants as in rats. A better method would be to compute the potency directly either as protective or as curative "rat units."

The dosage of viosterol should be increased from two and a half to three times. This can best be accomplished by increasing the strength of the solution.

16 West Eighty-Sixth Street.

SUPPURATION IN THE PARANASAL SINUSES AS A FACTOR IN FOCAL INFECTION

REVIEW OF FOUR HUNDRED CASES *

CARL M. ANDERSON, M.D.
ROCHESTER, MINN.

An analysis of 400 histories of consecutive cases indicates that suppurative sinusitis is not a significant factor in focal infection. There are good anatomic and physiologic reasons to support this conclusion. The paranasal sinuses are bony cavities which are supplied with natural avenues for drainage, and with facilities for evacuating accumulated secretions. The mucous membrane which lines the sinuses is ciliated, is thinner than elsewhere in the nose, and contains fewer glands. The secretions in the nose and accessory cavities resist bacteria and toxins soluble in water. Although little is known about the lymphatic system of the sinuses, it is certain that the lymphatic nodes and vessels are comparatively few.

Experimentally,[1] it was found necessary to rupture the lining membrane in order to secure reasonably rapid absorption. Clinically, regional lymph nodes involved during either acute or chronic sinusitis are rarely found. The temperature is either normal or low unless the sinusitis is accompanied by other acute infections, or the neighboring structures, namely, the tonsils, pharynx, trachea or bronchi, are involved. In chronic sinusitis, elevation of temperature is practically never present. Toxins are absorbed, especially during the acute stage, causing prostration, pallor, paresthesia, hyperesthesia, reflex pains and other toxic manifestations, but all symptoms are less frequent and are milder than in acute infection elsewhere. Local pains are caused by pressure because of swelling of the mucous membrane and interference with drainage. Bacteria are practically never absorbed unless neighboring structures are involved.

Wood,[2] after reviewing a large number of consecutive histories of cases, expressed the belief that "the production of secondary infection by direct absorption of bacteria into the circulation from sinuses is one of the rarest occurrences in medicine."

In 200 cases of sinusitis without other foci of infection, an analysis of the histories revealed three cases of rheumatism and one of bronchitis which were coincident with acute infection of the upper part of the respiratory tract. Approximately half of the patients presented themselves for examination because of trouble with sinusitis, whereas the other half were referred from the

---

* From the Section on Otolaryngology and Rhinology, the Mayo Clinic.

1. Mullin, W. V.: The Relation of Paranasal Sinus Infection to Disease of the Lower Respiratory Tract, J. A. M. A. **87**: 739-741 (Sept. 4) 1926.

2. Wood, V. V.: The Paranasal Sinuses as Sources of Infection, Ann. Otol. Rhin. & Laryng. **37**: 592-617 (June) 1928.

general services to the ear, nose and throat service while they were undergoing examination for various other ailments. The accompanying table summarizes the results of a study of a second group of 200 cases in which the patients had foci of infection in one or more regions in addition to the nasal sinuses.

In this second group of 200 patients, 26 per cent presented complications which may have been caused by focal infection. In recent years, much has been written about the presence of infection of the paranasal sinuses demonstrable only by taking cultures of the secretions or by surgical intervention. With convincing evidence at hand that the paranasal sinuses are of minor importance as a focus, it would seem that such procedures are not indicated.

CAUSE OF INFECTION

The nose has a definite and important function to perform, which it should be allowed to perform so far as possible. Too often one encounters patients with nasal symptoms which date from some intranasal operation performed in the vain hope of finding some hidden focus of infection or because the roentgenogram showed some cloudiness, although no complaints referable to the nose had been made previous to the operation. Although the roentgen ray is a valuable aid in demonstrating the conformation and distribution of the sinuses, and in many cases confirms the diagnosis of sinusitis, it should not be used as a positive or as the only means of establishing a diagnosis. Under such circumstances, it may be assumed that the infection was introduced, or made possible, by opening avenues for spreading the infection, or by lowering the resistance of the tissues and altering the nature of the protective nasal secretions.

Data Concerning Two Hundred Patients Who Had Foci of Infection in One or More Regions in Addition to the Nasal Sinuses

Nasal Sinuses and Other Foci of Infection	Cases	Associated Diseases and Symptoms: Rheumatism	Cardiac Disease	Neuritis	Renal Disease	Myositis, Myalgia	Duodenal Ulcer	Vertigo	Enteritis	Diabetes	Total
Teeth	81	8	1	..	1	1	2	1*	..	1	15
Tonsils	75	8	..	1	2	3	2	..	1	1	18
Prostate gland	15	1	..	..	1	..	1	..	..	..	3
Gallbladder	7	1	..	..	..	..	..	..	..	..	1
Appendix	4	..	..	..	..	..	1	..	..	..	1
Teeth and tonsils	8	4	3	..	..	..	1	..	..	..	8
Teeth and prostate gland	2	1	..	..	..	1	..	..	..	..	2
Tonsils and prostate gland	4	1	..	..	..	..	..	..	..	..	1
Teeth, tonsils and prostate gland	2	1	..	..	..	..	..	..	..	..	1
Teeth and urethra	1	..	..	1	..	..	..	..	..	..	1
Teeth and syphilis	1	..	..	1	..	..	..	..	..	..	1
Total	200	25	4	3	4	5	7	1	1	2	52

* Chronic alcoholism.

Even if active infection has not resulted, the normal functions of the nose have been disturbed, and secondary atrophy, with a sensation of dryness which is most noticeable in dry atmospheres, or severe pain in the upper pole of the nose on exposure to cold, may develop. These unfavorable sequelae occasionally follow intranasal operations in cases in which suppurative sinusitis has been noted, but here there is a definite complaint by the patient, and positive observations have indicated a surgical procedure. In such cases, one must assume the risk of unfavorable postoperative sequelae in order to eradicate a definite pathologic condition.

FOCAL INFECTION

The significance of focal infection, resulting in uncovering new and important foci, has been stressed. There is a tendency, however, to become too enthusiastic and to proceed without due caution and be led into error. For many years the posterior group of sinuses was considered significant in retrobulbar neuritis, with the result that intranasal surgical operations were performed without regard to the condition of the nose. Recently, the conviction that other foci are of more importance has been steadily gaining ground, and in only a small percentage of cases does sinusitis play an important rôle.[3] With careful research, and checking of available data, it will be realized that the paranasal sinuses are of even less importance as a focus of infection in general conditions. This opinion is corroborated by the clinical observation of rhinologists such as Shambaugh[4] and Mosher.[5]

Although the importance of foci of infection should not be minimized in the practice of medicine, it is sometimes allowed to assume too large a factor in treatment. There is no intention of minimizing the importance of caring for disease when it is found, but an attempt is made to emphasize the importance of careful diagnosis, conservative treatment (especially surgical), and the preservation of the normal functions of the nose and paranasal sinuses.

Great care should be exercised to view the patient as a whole rather than the nose as a detached or unrelated member. It should always be kept in mind that the nasal functions may be altered by the general physical condition and external influences, possibly to a greater extent than the general conditions might be affected by any disturbance in the nose. This essentially is true in regard to the paranasal sinuses. In many obscure conditions, too much dependence is placed on eradication of foci, and innumerable other conditions, equally significant, such as social status, environment, temperament, heredity and allergy, may be overlooked.

In dealing with a nasal condition, it should not be forgotten that general conditions sometimes bring on symptoms such as postnasal discharge of mucus and vasomotor rhinitis which are often diagnosed as sinusitis when there is no infection present. Following influenza an increased discharge of mucus is often noted, attributable to some change probably connected with the nervous control of secretions which has taken place in the general system. I have seen patients who have manifested symptoms of severe vasomotor rhinitis when angry. One patient complained of the same condition which appeared only when he drank alcohol. Obviously, any surgical or other form of local treatment of the nose under such circumstances would be misdirected.

3. White, L. E.: A Plea for Conservatism in Treatment of Optic Nerve Disturbances from Focal Infection, Laryngoscope **37**: 327-336 (May) 1927.
4. Shambaugh, G. E.: Infection of Maxillary Antrum, J. Am. Dent. A. **16**: 773-781 (May) 1929.
5. Mosher, H. P.: Personal communication to the author.

It was found that in cases in which infection of the teeth, the tonsils and the prostate gland was present, diseases attributable to focal infection were fairly constant. These diseases were almost entirely absent when sinusitis was the only known focus. From clinical observation, it is known that on rare occasions an infected sinus does act as a focus, but it is so rare an occurrence that unless careful examination and conservative investigation reveal evidence of such an infection, it may be considered of no importance. On the other hand, if there is evidence of sinusitis, the condition should receive proper attention even if the question of focal infection is not involved.

SUMMARY AND CONCLUSIONS

In a review of the histories of 400 cases, sinusitis was not a factor in focal infection. Teeth, tonsils, the prostate gland, and other foci are of more importance. Suppurative sinusitis may be a focus of infection on rare occasions. In a patient with a nose normal on clinical examination, and with a history negative for diseases that can be referred to the nose, any exploration which involves mutilation of the nasal membranes is not justified. Unnecessary trauma reduces the resistance of the membrane and may introduce infection. Toxins are absorbed by the blood stream, but bacteria are rarely transmitted to distant parts of the body from the paranasal sinuses. Existing infection of the nose and paranasal sinuses should be treated in the most conservative manner consistent with the complete eradication of the disease.

THYROTOXICOSIS IN ELDERLY PERSONS WITHOUT SIGNS OF GOITER

HUGO A. FREUND, M.D.
Chief of the Department of Medicine, Harper Hospital
AND
WARREN B. COOKSEY, M.D.
Assistant Attending Physician, Outpatient Department, Harper Hospital
DETROIT

Killins,[1] in a discussion of the diagnosis of exophthalmic goiter in elderly persons, points out the difficulty of recognizing the condition in patients over 55 years of age. He stresses the fact that there is "rarely a history of thyroid enlargement preceding the onset of the illness" and, furthermore, that even after the disease has been established for many months, swelling of the neck is unusual. That hyperthyroidism may exist without evidence of goiter is generally recognized by clinicians, though perhaps not thoroughly enough emphasized.

Tucker [2] called attention to this fact when he reported three cases of hyperthyroidism in which there was no visible or palpable thyroid enlargement and in which the correct diagnosis was not suspected by three observers.

Mohler [3] had previously reported a like number, of which one occurred in an elderly individual.

It is the latter type that concerns us particularly in this discussion, for it is our observation that cases of thyrotoxicosis in elderly persons actually develop without discernible or palpable goiter, and often present, as the chief complaints, abdominal and gastro-intestinal symptoms. Under these circumstances the recognition of primary exophthalmic goiter is likely to be obscure, as our group of cases demonstrates. Each one of our patients passed through the hands of several competent physicians without a correct diagnosis having been suggested. One patient had been seen by fourteen different physicians and had spent sixty days under observation in a large hospital in this city without the proper diagnosis having been suspected. Not one of this group had ever had goiter, nor could adenomatous tissue be found in those cases that later came to operation. They belong distinctly to the exophthalmic type. This is also borne out by the history of onset and the subsequent course of the disease.

Five cases are reported here. All the patients have been followed carefully for at least fifteen months. The case of longest duration, which has been checked with basal metabolic readings and studied in the hospital, was first seen more than four years ago. A few earlier cases not kept under hospital observation and more recent ones are not included in this report. Therefore, in every instance, time has made it possible to verify the diagnosis; in addition, several interesting details of treatment which seem of some significance have been revealed. The symptoms complained of have been nausea, vomiting, loss of appetite, abdominal pain, diarrhea, difficulty in swallowing with regurgitation of food, weakness and loss of weight. The diagnoses were gastric ulcer, carcinoma of the stomach, cardiospasm, obscure carcinoma of the gastro-intestinal tract, mucous colitis and gastric neurosis. Emaciation, a prominent sign in each case, was attributed to the patient's inability to take or retain food. Weakness and increased pulse rate were explained on the same basis. Exophthalmos was in no case a presenting sign, the gaunt appearance of several being considered, no doubt, the result of dehydration from hyperemesis. Nervousness, tremor and a sensation of heat were not initial complaints, nor were they ever pronounced during the course of the disease.

The following cases may be regarded as typical examples of this condition:

REPORT OF CASES

CASE 1.—L. G., a man, aged 69, married, a Russian Jew, first seen, Oct. 29, 1927, complained of vomiting, diarrhea and a loss in weight of 26 pounds (11.8 Kg.). He had never been ill. For several years he had noted some shortness of breath and palpitation, which were worse on admission. Ten weeks previously he had begun to lose appetite and to feel very weak. Four weeks later he began to vomit and for a few days vomited everything. At first there was no gastric distress, but gradually he began to complain of pain in the stomach and the vomiting occurred at irregular intervals. His physician prescribed "remedies" for his stomach; he improved slowly, so that for two weeks he had not vomited, although he felt very weak and had no appetite. Three days before entry he began to vomit again and stated that he had vomited a large amount of material, some of which he thought he had eaten "two days previously." The bowels had been normal, but with this last attack he began to have diarrhea. For three days he had taken nothing but water.

On examination the patient appeared emaciated, somewhat apprehensive and apparently quite prostrated. He was moderately dehydrated. There was some staring of the eyes, which, however, could easily have been accounted for by his emaciation, or on a racial familial basis. The teeth were in bad condition and the tonsils septic. The thyroid was not palpable; no substernal mass could be detected by percussion, and roentgen examination failed to reveal a substernal thyroid. The pulse rate was 124; the heart sounds were weak but clear; the blood pressure was 100 systolic and 70 diastolic. There was considerable tenderness in the right lower abdominal quadrant; no masses were palpable. The patient had slight

1. Killins, W. A.: M. Clin. North America **12**: 463 (Sept.) 1928.
2. Tucker, John: Am. J. M. Sc. **176**: 504 (Oct.) 1928.
3. Mohler, H. K.: M. Clin. North America **12**: 975 (Jan.) 1929.

tremor of the extended hands. A basal metabolism test was plus 51 per cent; the blood count was 4,230,000 red blood cells, 6,000 white blood cells, 49 per cent polymorphonuclears, 48 per cent small lymphocytes and 3 per cent large lymphocytes. Urinalysis was negative. The Wassermann reaction was negative.

The patient was immediately hospitalized and compound solution of iodine, 10 minims (0.6 cc.) three times a day, was given. In thirty-six hours he ceased vomiting. His general condition, however, remained unchanged; in fact, he became at times quite irrational. During the first week of hospitalization the pulse rate averaged 100. After twelve days of iodine medication the basal metabolism reading was plus 24 per cent; three weeks later it was plus 31 per cent. Two roentgen-ray treatments were then given over the thyroid region, one week apart.

After thirty-one days in the hospital the patient was allowed to get out of bed. His basal metabolism reading had fallen to plus 10 per cent, and his weight, which had been 116 pounds (52.6 Kg.) at entry, was 127 pounds (57.6 Kg.) at discharge. His progress was steady after he left the hospital, and at the end of three months' treatment his weight was back to nearly normal; he felt well. He continued compound solution of iodine for three months. For a period of seventeen months he remained so well that we heard nothing from him.

Sept. 16, 1929, we were again called and found the patient in the midst of a typical thyroid reaction with marked hyperemesis. Compound solution of iodine and sedatives were prescribed and in twenty-four hours the vomiting had ceased. He continued the medication for four weeks with complete relief from all symptoms. At the present time he remains perfectly well. He has flatly refused all advice regarding thyroidectomy, stating that at the age of 70 he is thoroughly satisfied with his condition.

CASE 2.—D. L., a man, aged 55, a Russian Jew, came to our office, Oct. 12, 1926, because of nausea, vomiting, weakness and pains in the abdomen. He had not felt well for two months, but his more severe symptoms began about four weeks before entry. He first complained of distress after eating, which he described as a "burning sensation in the pit of his stomach." At the onset there had been no nausea or vomiting, but gradually, with the increase of pain, he was nauseated nearly all the time. In the week preceding his entry he had had three attacks of vomiting coming on just before breakfast. At the onset of his illness he had entered a hospital in an adjacent city, where roentgen studies were made of the chest, gastro-intestinal tract and the gallbladder by the Graham technic. A diagnosis of duodenal ulcer was made and he was placed on strict ulcer management. This did not bring relief, although he had followed this treatment rigidly until he consulted us. His past history was entirely negative. One sister, he "thought," had died of "goiter."

On examination the patient appeared in fair condition although his weight, which was normally about 130 pounds (59 Kg.), was now 120 pounds (54.4 Kg.). His skin was hot, and the teeth and tonsils were markedly septic. There were no eye signs or tremor of the extended hand. The thyroid was not palpable. The blood pressure was 130 systolic and 70 diastolic; the pulse was 120. The heart was not enlarged, but a systolic murmur, not transmitted, was heard at the apex. There was tenderness over a small area in the epigastrium, but no muscle spasm. The liver was just palpable. A gastric aspiration was done which revealed a total acidity of 32 and a positive test for occult blood. The patient was sent to the hospital for further study. Here he was placed on strict ulcer management. Because of the combination of rapid pulse, vomiting, alertness and an absence of the characteristic symptoms of ulcer, thyrotoxicosis was suspected. The basal metabolic rate proved to be plus 42 per cent. Compound solution of iodine was given with striking results. In four days the pulse dropped to an average rate of between 80 and 90 and the gastric symptoms entirely disappeared.

During the three years that has elapsed since treatment was begun the patient has had six distinct exacerbations of hyperthyroidism, in spite of which he has made steady gain. Each "flare-up" was preceded by a period of a month or more during which time he was working hard and not taking compound solution of iodine. Each time he came in complaining of abdominal pain and loose bowel movements; each time his basal metabolism registered a correspondingly increased rate, and each time his symptoms disappeared when compound solution of iodine was resumed.

However, in March, 1929, the symptoms returned with great severity. The patient finally consented to operation, which was performed, April 8. The pathologic diagnosis was primary hyperplasia. While he developed a slight postoperative myxedema requiring thyroid medication, his condition is now satisfactory.

CASE 3.—J. M., a man, aged 61, an American, was carried into our office, July 11, 1927. He complained that for the past year he had progressively lost weight and strength, and for the preceding four months had been confined to his bed. He had consulted fourteen different physicians and had spent three months, until his funds were exhausted, in a hospital. Here a malignant condition had been suspected and sought, but he was discharged without a diagnosis having been made. His financial condition added to his discomfiture. He had vomited three times without apparent cause in the past six months. He had at no time suffered from nervousness, palpitation or tremor, but he said that his appetite was very poor. He slept well. A calculus had been removed from the bladder eight months before, but aside from this the patient had been robust all his life.

On examination, emaciation and asthenia were striking. His weight, which had been 156 pounds (70.8 Kg.) one year before, was now 94 pounds (42.6 Kg.). The skin was moist, but not hot or flushed. The head, eyes, ears, nose and throat were normal. There was not the slightest evidence of thyroid hypertrophy or of vascular bruit. There was no abnormal sternal dulness; a roentgenogram did not show a substernal shadow. A soft systolic murmur was audible at the apex; the blood pressure was 120 systolic and 80 diastolic, and the pulse rate 120. There was slight tremor of the hands of a rather coarse type. He was sent to the hospital, where it was found that his pulse was sometimes 120, even while resting in bed. Basal metabolism rates were plus 24 per cent and plus 25 per cent, respectively, on successive days. The blood count was 3,880,000 red blood cells, 6,150 white blood cells, 34 per cent polymorphonuclears, 58 per cent lymphocytes and 8 per cent basophils.

The patient was given compound solution of iodine, sedatives, and a high caloric diet. In ten days he gained 6 pounds (2.7 Kg.). In two months he had gained 37 pounds (16.8 Kg.) and was able to be up and walking, although he was very weak. During the past year the patient has continued to maintain his weight and is able to be up, but he is not able to work because of easy fatigue. Thyroidectomy was advised but refused. The basal metabolism rate when he was last seen was plus 13 per cent; the blood pressure was 150 systolic and 80 diastolic; the pulse was 106 at rest; there was slight tremor of the hands, and the thyroid was not palpable. The patient continues to take small doses of iodine, stating that, if he omits it for more than one or two weeks, all symptoms return. Resumption of the compound solution of iodine quickly restores his condition of well being. He maintains his normal weight of 150 pounds (68 Kg.). He still refuses thyroidectomy.

CASE 4.—Mrs. A. R., aged 50, an American, seen in consultation, Oct. 9, 1928, had been under the care of three different physicians, who had treated her for "stomach trouble." Her physician said that for five weeks she had vomited literally everything she ate, had lost 40 pounds (18 Kg.) and was very weak. There were more than fifteen different kinds of medicine at her bedside when she was first seen. It was learned that her symptoms had begun rather acutely about eight weeks previously. At first there was only weakness and shortness of breath on exertion, but gradually she began to lose weight and to vomit occasionally after a meal. These symptoms increased until she was vomiting everything.

The patient was sent to the hospital for observation. On admission her pulse rate was 128; the basal metabolic rate was plus 23 per cent and the blood pressure 190 systolic and 90 diastolic. The thyroid gland was barely palpable; her skin was warm and moist. The remaining physical and laboratory observations were unimportant. Compound solution of iodine

was given and in twenty-four hours all vomiting ceased. In the course of fourteen days the basal metabolism came down to plus 10 per cent, and the pulse rate to 80 a minute. In the following few months she was given a total of nine roentgen treatments over the thyroid region, prolonged rest and compound solution of iodine. Although she was much improved, her normal strength did not return and, as there was still slight tachycardia and an elevation of the basal metabolic rate, operation was advised. This was performed, May 23, 1929. The pathologic diagnosis was primary hyperplasia.

The patient's return to normal was slow even after the operation. She is now able to do her house work. Her pulse rate is 80; the blood pressure is 170 systolic and 100 diastolic and her basal metabolic rate is minus 12 per cent; the weight is normal.

CASE 5.—Mrs. P. T., aged 75, first consulted her physician nine years before for what was described as repeated "bilious attacks" with nausea and vomiting. The physician stated that at the time of examination no abnormalities were present and the heart rate and blood pressure were not elevated. He ascribed the patient's attacks to excessive coffee drinking, which she was loath to give up. About three months prior to the present illness the patient had had a recurrence of an old nasal sinus infection for which she was treated for some time. The sinusitis persisted despite treatment, and along with it some joint pain and stiffness developed. Vaccine treatments were given for three weeks without benefit. In fact, the patient's condition was getting worse in that her appetite became impaired, nausea was frequent, and she occasionally regurgitated food.

Nov. 2, 1927, the patient's physician was called to see her because of partial relapse, vomiting and weakness. He found her with a rapid heart rate, a systolic murmur at the apex and prostrated to such a degree that he ordered her to bed and advised cessation of both the nasal treatment and the administration of vaccine. Rest in bed, diet and medication did not relieve the persistent nausea and vomiting. A gastro-enterologist was called in consultation, who removed her to the hospital for observation. Gastric analysis could not be done because of inability to pass a tube, which the hospital report shows was not persisted in because of the patient's condition. The roentgenologic report suggested a cardiospasm, because there was "constant delay at the cardiac orifice of the stomach, with a slight dilatation of the adjacent esophagus." Carcinoma of the cardiac orifice of the stomach was considered because of the patient's weakness, loss of weight and age, but actual evidence of this was lacking. The gastro-enterologist was reluctant to pass a bougie because of the patient's heart condition.

At this time the patient was seen by one of us in consultation. A careful history revealed a loss of weight, a persistent regurgitation of food without real difficulty in deglutition or sense of pain at the ensiform cartilage, and a rapid bounding pulse. There was no tremor, no ocular disorder and no complaint of excessive heat. The thyroid was not palpable; roentgenograms of the chest did not show substernal goiter. The presenting symptoms and signs were a constant regurgitation of food, the rapid heart rate and profound asthenia. A diagnosis of hyperthyroidism was suggested and compound solution of iodine, 15 drops every eight hours, was advised. After the second dose nausea and vomiting ceased, signs of cardiospasm vanished and the patient rapidly improved, gaining weight and strength.

The last report on this patient, Jan. 31, 1930, stated that she omitted iodine after taking it persistently for three months, her physician believing that it might have harmful effects. Symptoms, however, reappeared six weeks later, so that the patient resumed the iodine solution. At the present time she is able to attend to all her household duties and considers herself as well as formerly.

SUMMARY AND CONCLUSIONS

Primary hyperthyroidism frequently occurs in elderly persons without visible or palpable goiter. These patients more often present symptoms referable to the gastro-intestinal tract as their initial complaint.

The usual signs of exophthalmic goiter are generally obscure.

Compound solution of iodine promptly controls and terminates the vomiting, which in one instance had persisted for four weeks without relief.

Subtotal thyroidectomy is often necessary. Prolonged preliminary treatment, however, is essential to prepare these patients for operation. Their response to treatment is striking and progressive, materially improving their chances for recovery from operation.

In the two cases that came to operation, intensive preliminary treatment did not prove adequate. In three cases the continued use of iodine solution with only slight periods of interruption has succeeded in arresting the hyperthyroidism. Its prolonged administration in these cases has not produced ill effects. Its continued administration is apparently essential to maintain the patient's sense of well being.

62 Kirby Avenue, West.

THE CONCENTRATION OF ANTI-PNEUMOCOCCUS SERUM*

LLOYD D. FELTON, M.D.
BOSTON

An important consideration in the study of antipneumococcus serum is a satisfactory valuation of its therapeutic activity. This immune serum, in contradistinction to the antitoxic serums, is classified with the antibacterial serums, and as such gives ample demonstration of containing all the known varieties of antibodies. However, although not entirely satisfactory in determining its therapeutic activity, the present method of choice is the estimation of the so-called protective antibody by means of some form of mouse protection test. For this test two procedures are advocated: first, the injection of a constant dose of serum with a varying number of organisms, the standard method of the U. S. Hygienic Laboratory[1] based on work of Neufeld[1a] and that done at the Rockefeller Institute,[2] and, second, the injection of a constant dose of organism with varying dilutions of serum.[3] These two methods in my hands have given roughly the same results when potent serums, relatively free from the so-called zone reaction, have been tested. However, when attempts were made to utilize the principle of the Hygienic Laboratory test in estimating the comparative titers of serum and of antibody, especially of type II and type III antiserums, it failed to quantify as accurately as the second one suggested here, namely, the use of a constant dose of a relatively dilute culture against a varying amount of serum.

The Hygienic Laboratory test requires the survival of 50 per cent of the mice injected simultaneously with 0.2 cc. of serum and 0.1 cc. of an eighteen hour broth culture of pneumococcus of such virulence that 0.00000001 cc. causes a fatal infection. The unit of protection that I use is that amount of serum injected

* From the Department of Preventive Medicine and Hygiene, Harvard University Medical School.
* This is one of a series of studies carried out in part under a grant by the Influenza Commission of the Metropolitan Life Insurance Company.

1. Potency of Antimeningococcic and Antipneumococcic Serums, Pub. Health Rep. **34**: 2657 (Nov. 21) 1919.

1a. Neufeld, F., and Händel, L.: Ueber Herstellung und Prüfung von Antipneumokokkenserum und über die Aussichten einer spezifischen Behandlung der Pneumonie, Ztschr. f. Immunitätsforsch. u. exper. Therap., orig. **3**: 159, 1909.

2. Avery, O. T.; Chickering, H. T.; Cole, Rufus; and Dochez, A. R.: Acute Lobar Pneumonia, Prevention and Serum Treatment, Rockefeller Institute Monograph 7, Oct. 16, 1917.

3. Felton, L. D.: The Units of Protective Antibody in Antipneumococcus Serum and Antibody Solution, J. Infect. Dis. **43**: 531 (Dec.) 1928.

simultaneously with broth culture which will protect mice against one million lethal doses of virulent pneumococci. Hence, any serum that passes the Hygienic Laboratory test contains by definition at least 50 such protective units per cubic centimeter, since 0.1 cc. of a culture which will kill mice in 0.00000001 cc. contains ten million lethal doses, and 1 cc. of serum would be $1 \div 0.2$ cc. $\times$ 10,000,000, or 50,000,000, or 50 units per cubic centimeter.

However, in actual tests by the unit method, a wide variation in potency ranging from 100 to 2,000 units per cubic centimeter was noted in serums that already had passed the Hygienic Laboratory standard. In other words, the Hygienic Laboratory test is one that sets a minimum standard of potency but does not measure the extent by which the serum may exceed this standard in protective value. Thus, of two samples of serum passing this test, one may well have a protective value for mice ten times greater than the other. A comparison of the two methods has been made and will be reported more in detail in another publication.

During the past five years, in studies of antipneumococcus serums, the second method has been applied in estimating the number of protective units both in the serum from many horses and in the concentrate, with the result that a wide range of variation in the potency of both type I and type II serums was found. Thus,

TABLE 1.—*Comparison of the Common Immunologic Reactions of Pneumococcus Serum and Its Concentrate*

	Serum		Concentrate	
	Type I	Type II	Type I	Type II
Precipitins	25-50*	25-100	100-900	200-2,000
Agglutinins	10	20	100	300
Complement fixation	10	20	100	120
Opsonins	40	40	360	320
Bactericidal action †	10^3	5×10^2	2×10^6	2×10^5
Protection	500	400	7,000	3,000
Neutralization	50	25	500	300

* The figures indicate the highest dilutions giving positive reactions.
† The figures indicate the actual number of bacteria killed.

type I serum has varied from a low level of 25 units to a maximum of 2,400 units per cubic centimeter, the most potent serum so far tested; while with type II, the serum of greatest potency had 2,000 units per cubic centimeter. Furthermore, the records of this five-year period show from year to year a definite increase in the potency of the serums, so that today these are on the average two or three times more potent than at the beginning of this period.

The explanation for this improvement may be, first, the renewed interest in antipneumococcus serum due to the demonstrated possibility of making antipneumococcus concentrate; second, an incentive to the production of a more potent serum as the result of a more accurate method of estimating protective strength, just as establishing a unit in toxin and antitoxin reacted favorably for the production of a higher grade of diphtheritic and tetanic antitoxic serums, and, third, improvements in the method of immunization, the most important of which, from a practical standpoint, is the use of the formolized antigen.[4]

While it has been possible to produce highly potent type I and type II serums, the production of a type III serum is still a problem. When a relatively avirulent type III organism is used to immunize horses, a serum is produced which in vivo shows an activity against the same strain of organism comparable to that of the best type I and II antiserums against their respective organisms. However, such serum does not exhibit any appreciable protective value against a freshly isolated, virulent type III organism.

In most of our work, protection tests in mice have alone been relied on as an index of the degree of concentration. However, a preliminary comparison has been made of the entire gamut of known immunologic reactions both on whole serum and on its concentrate. These various immunologic reactions gave positive tests both in antipneumococcus horse serum and in its concentrate, but the titers recorded are much lower than those obtained by estimating the so-called protective antibody. Table 1 summarizes the results of one experiment given as an example. The whole serum and the concentrate in each test were studied as nearly as possible under the same conditions at the same time. From the results shown in the table, there can be no reasonable doubt that the concentrate represents a real concentration of all the known antibodies of this immune serum. These results are a confirmation of others reported elsewhere.[5]

The protein with which the protective antibody is associated is a relatively water-insoluble protein,[6] while many experiments have clearly demonstrated that the albumin and water-soluble pseudoglobulin are definitely inert. To be sure, serums, mostly of low potency, from a few horses, have indicated the presence of some of the protective globulin in the water-soluble pseudoglobulin. In pooled serum of average potency, however, by actual test, the protein fractions other than the water-insoluble contain but little protective substance. This active protein may be separated from the other serum proteins by any one of five methods, and when separated may be dissolved so as to constitute from one fifth to one tenth of the volume of the original serum.

Unfortunately, many horses have serums of which solutions of the entire water-insoluble protein fractions produce on intravenous injection definite and severe thermal reactions. In attempts to separate the classic euglobulin from the protective protein by acid fractionation, that fraction of the water-insoluble protein which, however, is soluble in dilute neutral salts (twentieth-normal) at p_H 4.8 to 5 not only proves to be nearly free from untoward thermal reactions but also contains most of the protective protein. In other words, the active protein, being more alkaline in reaction than the classic euglobulin, remains in solution at p_H 4.8 to 5 while the latter is precipitated. After the inert acid fraction thus precipitated has been discarded, the residual protein, depending on the quality of the original serum, represents from 10 to 15 per cent of the total serum proteins. Table 2 represents the distribution of the active protein and the protein nitrogen in an average lot of type I and type II polyvalent serum and its concentrate. The potency of the latter against both type I and type II pneumococci is ten times, or even more, that of the original serum, while its nitrogen content is only about 13 per cent ($14.6 \div 11.2 \times 10 = 13$) of the total serum nitrogen.

The problem, therefore, has been one not only of the concentration of the protective antibody but also of the preparation of an active globulin that will not cause a

4. Applied to the immunization of horses against the pneumococcus by the Lederle Antitoxin Laboratories (personal communication to the author).

5. Felton, L. D., and Bailey, G. H.: The Immunological Characteristics of a Water-Insoluble Protein in Type I Antipneumococcus Sera, J. Immunol. **11**: 197 (March) 1926.

6. Felton, L. D.: Concentration of Pneumococcus Antibody, J. Infect. Dis. **43**: 543 (Dec.) 1928.

thermal reaction when intravenously injected. It has long been known, though but little emphasized, that large volumes of immune horse serum, or even normal horse serum, when injected intravenously produce reactions of varying degrees of severity. The cause of such reactions has not yet been determined. I am, however, inclined to the view (bearing in mind the possible influence of a heterophylic antibody) that these reactions are in some way associated with a water-insoluble protein fraction, which is present in both normal and immune horse serums. For, when the entire water-insoluble protein fraction from antipneumococcus horse serum is concentrated tenfold, a 10 cc. dose will give a reaction seemingly as severe as 100 cc. of the original serum. In other words, the protective and reactive substances are both associated with water-insoluble proteins, and thus the two are concentrated in the same process. However, the elimination of an acid fraction of the entire water-insoluble protein leaves a second more alkaline fraction in solution which may be injected intravenously with but little or no severe thermal reaction. It has also been found that this acid fraction from the serums of some horses neutralizes the protective activity of antipneumococcus serum or concentrate. The acid fraction, however, is not the sole cause of the thermal reaction following the intravenous injection of serum or of the entire water-insoluble protein, as toxins due to bacterial contamination during storage and manufacture may play some part. However, the elimination of this acid fraction, or the change occurring during the process of elimination, does more than any other single step to make a solution of the protective antibody suitable for intravenous therapy.

TABLE 2.—*A Comparison of the Protective Potency of Antipneumococcus Serum and Its Concentrate and the Distribution of Nitrogen per Unit of Protection*

Polyvalent Lot 48

Type I

Dilutions of Concentrate * Previously Diluted 1 : 10			Dilutions of Serum		
1 : 300	1 : 200	1 : 100	1 : 300	1 : 200	1 : 100
36†	36	S	36	36	36
42	36	S	36	36	60
60	36	S	36	36	60
60	42	S	42	36	60
60	84	S	42	36	S
S	S	S	60	36	S
S	S	S	60	36	S
S	S	S	S	60	S
S	S	S	S	60	S
S	S	S	S	S	S

$10 \times 100 \times \frac{14}{3} = 5{,}000$ units per cc. $\quad 100 \times \frac{14}{3} = 500$ units per cc.

Type II

22	19	18	18	42	24
24	36	36	36	60	36
36	36	84	36	60	S
36	36	S	36	60	S
36	60	S	42	60	S
36	84	S	60	60	S
36	S	S	60	84	S
42	S	S	60	84	S
60	S	S	60	S	S
84	S	S	S	S	S

$10 \times 100 \times \frac{18}{3} = 6{,}000$ units per cc. $\quad 50 \times \frac{18}{3} = 300$ units per cc.

Control Organisms

Type I Dilutions				Type II Dilutions			
10^{-9}	8×10^{-8}	6×10^{-8}	4×10^{-8}	10^{-9}	8×10^{-8}	6×10^{-8}	4×10^{-8}
36	36	36	36	36	22	24	22
36	36	36	36	36	36	36	36
36	36	36	36	36	36	36	36
S	36	S	36	S	60	48	S
S	S	S	36	S	S	S	S

Plates (1 cc.)

Type I 10^{-8}	Type II 10^{-8}
28	36

Nitrogen Distribution

Concentrate			Serum	
Milligrams per Cc.	Milligrams per Unit of Protection		Milligrams per Cc.	Milligrams per Unit of Protection
14.6	0.0029	Type I	11.2	0.0224
	0.0024	Type II		0.037

* All mice received simultaneous injections of 0.5 cc. of both of the different dilutions of serum and of an eighteen hour autopsy culture diluted 1 : 200.

† The figures refer to hours of survival; S indicates survival.

The relatively high potency of the protective globulin is brought out by the following comparison with ethylhydrocupreine hydrochloride (optochine). With the same technic as is employed to estimate units of protection of antipneumococcus serum, ethylhydrocupreine under optimal conditions is effective in mice against no more than 1,000 lethal doses of virulent pneumococci. This requires a dosage of 2 mg., though from 3 to 4 mg. is the lethal dose for an 18 Gm. mouse. Thus it would require $0.002 \times 1{,}000$, or 2 Gm., of ethylhydrocupreine to protect mice against a million lethal doses of pneumococci, the standard unit—a truly impossible amount. On the other hand, a concentrate from serum may be prepared in such a way that 0.02 mg. of active protein contains one protective unit. Thus, regardless of the toxicity of ethylhydrocupreine, 2 Gm. of ethylhydrocupreine or 0.02 mg. of protective protein has in vivo the same bactericidal action. In other words, the protective globulin is one hundred thousand times (2,000 mg. ÷ 0.02 mg. = 100,000) more effective than ethylhydrocupreine. A similar comparison of protective globulin with quinine sulphate, of which 2 mg. protects against 100 fatal doses of pneumococci, shows a ratio of 1,000,000 to 1, the protective globulin, as shown by protective tests on mice, thus being one million times more active than quinine sulphate. In addition, the active globulin can be given in relatively large doses, whereas ethylhydrocupreine and quinine sulphate both are protoplasmic poisons and show only a small margin of therapeutic value between their organotropic and bacteriotropic activity. It would thus appear that the protective globulin is an almost ideal chemotherapeutic agent, apparently without any organotropic but with a highly bacteriotropic activity. These comparisons, however, are based on protection tests in mice and may not necessarily indicate relative therapeutic activity in lobar pneumonia. However, the high in vivo protective action of the protective globulin as compared to one of the best known pneumococcidal drugs calls for continued study of the therapeutic value of the concentrated protective globulin.

The advantages of the concentrate over whole serum are no doubt similar to those of any real immune serum concentrate and may be here briefly summarized as consisting in convenience, reduced protein per unit of protection with the consequent lessening of serum sickness, and milder and infrequent thermal reactions. It must be remembered, however, that the active globulin is a protein, and the usual tests for sensitivity to this protein should be carried out before intravenous injection.

There are two elements in the serum treatment of lobar pneumonia that should be emphasized. The first, the proper dosage, has not as yet been completely worked out, although the studies of Park, Cecil, Bullowa and their collaborators are doing much toward the solution of this problem. How much the experience with whole serum will aid in determining the proper dosage of the concentrated material is problematic, as the

method for estimating potency now in use (Hygienic Laboratory method) gives no indication of the extent by which the serum may surpass in potency the minimum standard. Thus, in my study of type I serums which had actually passed the Hygienic Laboratory standard, there has been a variation in potency of from 200 to 2,400 units per cubic centimeter. Now, if the dosage of serum advocated by Cole should be employed, i. e., 100 cc. at a time and repeated according to clinical conditions, and if it should be assumed that the serum employed is of high titer, perhaps 1,000 protective units per cubic centimeter, then the protective units administered would range from 100,000 to 300,000 or 400,000 units according to the number of doses. On the other hand, if a serum just able to pass the Hygienic Laboratory standard should be employed (50 units per cubic centimeter), then the total number of units given, according to the number of doses, would range only from 5,000 up to 15,000 or 20,000 units. It may be seen, therefore, that in the case of whole serum that has passed the Hygienic Laboratory standard there may be, with the same dosage, a tenfold variation in the number of protective units administered.

On the other hand, the dosage of concentrate based on the clinical results obtained at different hospitals has shown a certain degree of uniformity. Park [7] suggests the use of a minimum of 30,000 units in the first twenty-four hours, with additional dosage according to the clinical indications. Cecil,[8] on the other hand, is inclined to use a larger dosage, especially in the early period of the disease. Bullowa [9] suggests from 15,000 to 20,000 units every four or six hours, the dose being increased if clinical conditions require, or as judged by the results of certain laboratory tests.

The second element, common to all serum treatments and emphasized by numerous investigators, is early treatment. The serum treatment of diphtheria has taught the lesson of timeliness in practical serum therapy. How many cases of diphtheria respond favorably to serum treatment on the fifth, fourth or even the third day as compared with the results of serum therapy in the first twenty-four or forty-eight hours after onset? While diphtheria and pneumonia are not exactly comparable, if the serum treatment of pneumonia is to have a fair test, methods for early diagnosis must be further developed so that serum treatment may be promptly administered.

Finally, if it is granted that all the various antibodies of antipneumococcus serum aid in the mechanism of defense (by no means an established fact), and also that all are associated with a water-insoluble protein of immune horse serum, the question still arises, Is there present in the whole antipneumococcus horse serum some therapeutic activity not found in the concentrate? Without denying this possibility, to my knowledge there is no evidence to support such an assumption. The mouse protection tests show definitely that the concentrate with a protective value for mice ten or more times greater than that of the serum from which it was made is active against millions of fatal doses of virulent pneumococci. Also, the clinical reports of Park, Cecil, Bullowa and others indicate that the concentrated serum possesses definite therapeutic value. After all, however, the final criterion must lie in the therapeutic results. Given a more potent immune horse serum, a concentrate of higher unit value, better understanding of dosage and early administration, and the real answer as to the therapeutics of this immune serum treatment of lobar pneumonia will be found.

7. Park, W. H.; Bullowa, J. G. M., and Rosenblüth, M. B.: The Treatment of Lobar Pneumonia with Refined Specific Antibacterial Serum, J. A. M. A. **91**: 1503 (Nov. 17) 1928.
8. Cecil, R. L., and Sutliff, W. D.: The Treatment of Lobar Pneumonia with Concentrated Antipneumococcus Serum, J. A. M. A. **91**: 2035 (Dec. 29) 1928.
9. Bullowa, J. G. M.: The Serum Treatment and Its Evaluation in Lobar Pneumonia, Bull. New York Acad. Med., second series **5**: 328, 1929.

DIFFERENTIAL BLOOD CULTURES*

REUBEN OTTENBERG, M.D.
NEW YORK

In cases of bacteremia it often is a problem to determine which of several lesions is the source of the bacteria in the blood stream. The decision becomes particularly important when there is a suspicion of lateral sinus thrombosis following otitic infection.

Such an obscure case led me four years ago to devise a simple procedure by which blood cultures were made from the internal jugular vein directly draining the suspected lesion. The number of bacteria in the blood of the suspected internal jugular vein was compared with the number in the blood of the opposite internal jugular, and more recently also of the arm vein. It was thought that the vein draining the lesion should show the largest number of bacteria.

TABLE 1.—*Differential Blood Cultures in Cases of Thrombosis or Phlebitis of the Lateral Sinus**

Case	Side of Lesion at Operation	Colonies per Cubic Centimeter of Blood: In Internal Jugular of the Same Side	In Internal Jugular of the Opposite Side	In Arm or Leg Vein
A. Cases of Thrombosis with Complete Occlusion				
1	Left	9	278	..
2	Left	8	25	..
3	Right	15	67	..
4	Left	7	122	6
5	Right	2	1	..
25	Right	600	11	1
32	Right	250	240	¼
34	Left	2	9	1
38	Left	45	1	1 (27)
6	Left	0	0	..
20	Left	0	0	0
B. Cases of Phlebitis (Mural Thrombosis)				
7	Left	142	16	..
8	Left	1	1	..
21	Left	225	88	..
29	Left	89	34	9
46	Right	165	64	88
30	Left	0	0	0
31	Right	Flask positive 0	Flask positive 0	Flask positive 0
26	Right	Flask positive 0	Flask positive 0	Flask positive 0
27	Left	0	0	Flask positive 0
C. Cases of Probable Phlebitis (culture 24 hours after operative exposure of lateral sinus)				
23	Right	24	7	0
41	Right	1½	1	⅓

* The organism found was beta streptococcus (hemolytic streptococcus) in all cases except case 5, in which it was a diptheroid bacillus; case 7, in which it was alpha streptococcus, and case 26, in which it was a pneumococcus type III (mucosus).

This procedure, of course, is quite different from the well known (but seldom used) one of Leutert,[1] who first introduced blood cultures into otology. He proposed to expose at operation the internal jugular vein and the lateral sinus, to draw blood from each and from an arm vein, and then to wait for the result of the colony count before performing the second stage of the operation.[2] The present method is intended for preoperative diagnosis.

* From the Laboratories of Mount Sinai Hospital.
* The otologic cases were studied through the courtesy of Dr. Isidore Friesner.

1. Leutert: Arch. f. Ohrenh. **46**: 190, 47, 1899.
2. Leutert: Arch. f. Ohrenh. **74**: 18, 1907; München. med. Wchnschr. **56**: 2300, 1909.

Two years ago I published the results in the first fifteen cases in which the new procedure was practiced.[3] I have now used it in twenty-nine more cases, making forty-four in all, including four in which the arm or leg arteries were aspirated and one in which cultures were made from the blood from both femoral veins. At present I will report the results in proved cases of sinus involvement and of bacterial endocarditis and discuss the general interpretation of these results. The technic of aspirating the internal jugular vein will be omitted because it has been described in the preliminary papers.[3] It suffices to say here that the procedure is safe and not very difficult; the only special maneuver required is placing the patient in the Trendelenburg position.

GENERAL SUMMARY

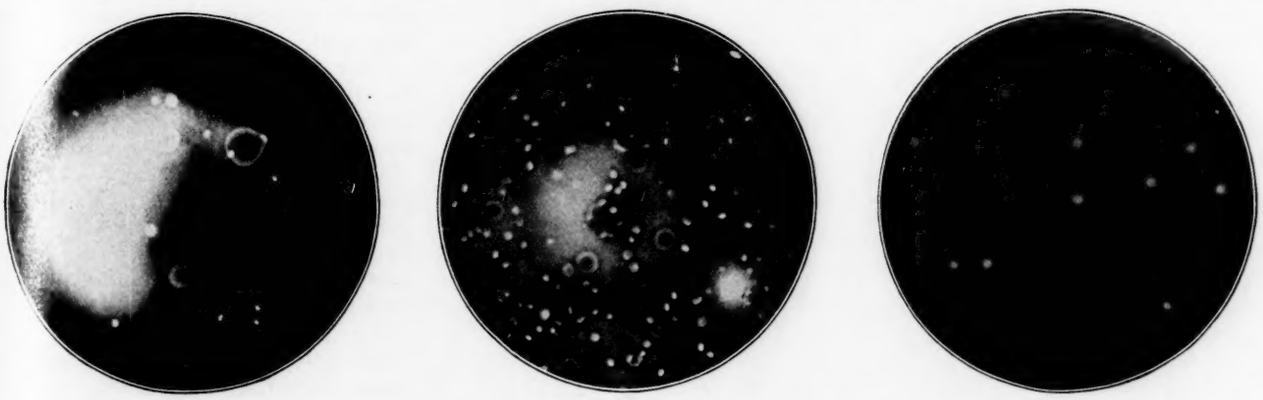
From the onset a surprising observation was made: In more than half the cases of sinus thrombosis in which bacteria were found in the blood, the preponderating number of bacteria was found not in the blood of the internal jugular vein on the same side as the thrombosed lateral sinus and directly draining it but in the internal jugular vein draining the opposite or normal sinus (fig. 1). Several explanations for this phenomenon are possible. The most likely one is that in these instances bacteria are growing chiefly at the upper end of the thrombus, and get into the circulation by way of the anastomoses to the opposite unobstructed jugular vein.

These anastomoses are very wide and numerous; Hansberg[4] has shown that in the presence of a thrombus in the lateral sinus the direction of the blood current is reversed in many of the sinuses, and Libman[5] has demonstrated that bacteria may be growing at one end of a thrombus and not at the other. In every one of my cases in which the preponderating number of bacteria was on the normal side, an obliterating thrombus was found on the diseased side at operation. In those cases of obliterating thrombosis in which the preponderance of bacteria was found in the vein of the diseased side, it is probable that the bacteria were being fed in chiefly from the lower end of the thrombus.

In cases of sinus phlebitis without complete obstruction to the normal blood current in the sinus, one would expect to find the larger number of bacteria in the homolateral jugular vein, and this was the case in four such instances in the series (table 1 and fig. 2).

The first conclusion, then, is this: In a case in which the question of sinus thrombophlebitis has arisen, the finding of a much greater number of bacteria in the blood of one internal jugular vein than of the other confirms the diagnosis of sinus wall infection. But it is impossible from the bacterial count alone to tell on which side the infection is, or whether there is a mural phlebitis or an occlusive thrombosis.

If bacteria can be fed off from either end of a thrombus, one would expect them occasionally to be fed off in approximately equal numbers from the two ends. This has actually been demonstrated to occur in at least one of my cases (case 32). In such instances one expects approximately equal numbers of bacteria in the two jugular veins, but by counting at the same time the number of organisms in some other distant vein, one should be able to demonstrate that the bacteria are coming from the cranium (and by inference from the lateral sinus) rather than from some other part of the body. For such comparative counts an arm or a leg vein is aspirated and the small number of bacteria in it as compared with the two jugulars provides the needed evidence. In case 32 the blood of the right internal jugular vein showed 250, that of the left 240 colonies per cubic centimeter of blood and that of the arm vein only one colony for every 3 cc. of blood (fig. 3). At operation an extensive obliterating purulent thrombus was found in the right lateral sinus. In this instance the jugular cultures without the arm culture would have given no indication of the source of the bacteremia.



A B C

Fig. 1 (case 4).—Blood plates in thrombosis of the left lateral sinus: *A*, culture of blood from the jugular vein of the affected side (left); *B*, culture of blood from the jugular vein of the normal side (right); *C*, blood culture from the arm vein.

It was the consideration of this possibility that led me to add simultaneous cultures from an arm or leg vein in all of the last twenty-five differential blood cultures. The results have been extremely interesting. In sinus thrombosis with positive cultures, the peripheral cultures showed a much smaller number of bacteria than one or the other jugular vein.

DIAGNOSTIC APPLICATION

Differential blood cultures have been of real diagnotic value in many of the cases. Specifically they have been of use in the following situations:

1. In several cases of mastoiditis in which there was only a suspicion of sinus thrombosis, a positive difference in the jugular observations made the suspicion a certainty.

2. Conversely, in many such cases in which only a suspicion existed, the finding of sterile blood in both

3. Ottenberg, Reuben: Differential Jugular Blood Cultures in Sinus Thrombosis, J. A. M. A. **90**: 1602 (May 19) 1928. Laryngoscope **37**: 424 (June) 1927.

4. Hansberg, W.: Ztschr. f. Ohrenh. **44**: 277, 323, 1903.

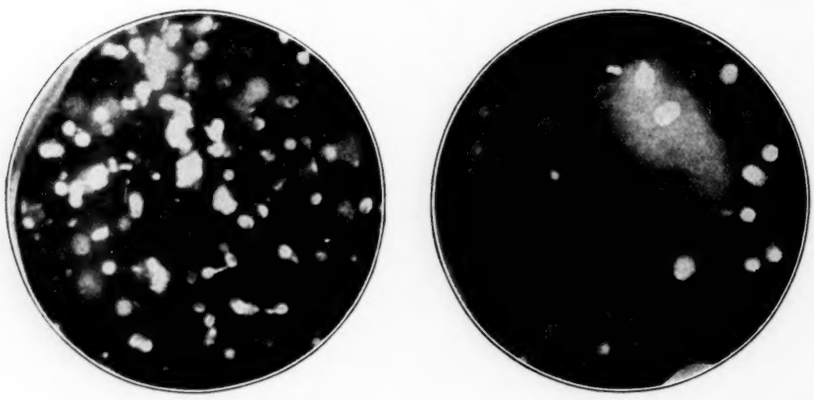
5. Libman, Emanuel: Tr. Ninth Internat. Otol. Cong., Boston, 1912, p. 127.

jugular and peripheral cultures gave the surgeon some additional moral support in withholding operation.

It is well known, of course, that negative blood cultures do not rule out sinus thrombosis; negative cultures were obtained (at least once) in five of my twenty proved cases. On the other hand, in twelve cases in which the cultures were made because of a suspicion of thrombosis, and in which the results were negative, recovery occurred without further intervention. With a negative culture the surgeon has to depend on his clinical impression, but a negative culture result deserves consideration in determining his decision.

3. An important group of cases in which the method has been of value is what the otologists term primary jugular bulb thrombosis.[6] These occur as cases of obscure septicemia with evidence of antecedent otitis but no definite mastoiditis. Case 25 is an example:

A boy, aged 11 years, had had a chronic discharge from the right ear for two years. For eight weeks prior to admission there had been irregular periods of fever with no new ear manifestations. He had spent two weeks in one hospital, where he had been discharged with a diagnosis of irregular grip. He did not give the impression of being very ill when admitted, but the spleen was palpable and the temperature was 103 F. There was no mastoid tenderness or edema and the ears showed only an old perforation of the right drum. A differential blood culture was taken at once, and showed 600 streptococci per cubic centimeter of blood from the right jugular, 11 from the left jugular and only 1 from the arm vein. On the basis of this finding, the otologist decided to operate.



A B

Fig. 2 (case 7).—Blood plates in phlebitis of left lateral sinus: *A*, culture of blood from the jugular vein of the affected side (left); *B*, culture of blood from the jugular vein of the normal side.

On account of the chronic lesion in the right ear, the right side was explored. He found as the only involvement in the mastoid a few granulations; the sinus plate was intact; the markedly thickened sinus contained an organizing thrombus extending from below the knee of the sinus into the jugular bulb. The boy recovered.

4. A fourth and very important group in which the method has proved of value consists of cases of known bacteremia and a mastoiditis (in which operation has often already been performed) but also showing endocarditis, pneumonia, kidney suppuration or osteomyelitis.

An illustration of this group is case 32:

A child, besides mastoiditis, had pneumonia and marked pyuria. After pediatric and urologic consultations there still existed a doubt as to whether the lateral sinus should be opened. Differential culture showed 250 colonies per cubic centimeter in the right and 240 in the left jugular vein and only 1 colony for each 3 cubic centimeters of blood in the arm vein. It was reasoned that, if the bacteremia had been due to the pneumonia or to the kidney suppuration, the numbers in the three veins would have been equal. Accordingly, the suspected lateral sinus was operated on and an extensive breaking down purulent thrombus was found.

5. Conversely, in such a doubtful situation the finding of approximately the same number of bacteria in the right and left jugular veins and in one of the extremity veins is against the sinus being the source, and in favor of one of the other possible foci as the source of the bacteria. Thus, in two cases (19 and 20), such observations confirmed the existence of acute bacterial endocarditis secondary to otitic infection and subsequently proved at autopsy. In these cases futile operation was thereby prevented.

STATISTICAL ANALYSIS OF RESULTS

In the whole series there were forty-four cases: thirty-nine were cases of mastoiditis in which sinus thrombosis was suspected clinically. Of these thirty-nine cases, sixteen gave negative differential blood cultures at all sites and eleven of these sixteen proved to be cases of simple mastoiditis without sinus thrombosis.

Five of the negative cases turned out to be cases of sinus thrombosis, nevertheless. But in four of the five cases positive blood cultures were obtained from the arm vein either previous or subsequent to the jugular culture. If differential blood cultures had been repeated, it is almost certain that definite results would have been obtained.

Of the twenty-three patients with positive blood cultures, three had subacute bacterial endocarditis (due to streptococcus alpha). These showed approximately equal numbers of colonies in the two jugular veins and the arm veins.

Of the twenty cases of proved sinus thrombosis or phlebitis, fifteen gave positive blood cultures from the jugular veins and ten of these fifteen showed a decided difference in the number of colonies in the right and the left jugular blood.

Three cases of sinus thrombosis showed approximately equal numbers of bacteria in the two jugular

TABLE 2.—*Multiple Blood Cultures in Cases of Bacterial Endocarditis*

Case	Clinical Type	Organism Streptococcus	Right Jugular	Left Jugular	Arm Vein
15	Subacute	Alpha	14	10	16
19	Acute	Beta	11	11	.. *
20	Acute	Beta	258	.. †	282
35	Subacute	Alpha	11	3 ‡	10
39	Subacute	Alpha	153	175	200 §

* One of the early series of otitic cases in which blood was not taken from the arm vein. At autopsy, acute bacterial endocarditis complicating mastoiditis was found without sinus thrombosis. It will be observed that the number of colonies in the two jugular veins is equal.

† The left internal jugular vein had been tied at the antecedent operation for sinus thrombosis; the acute bacterial endocarditis had subsequently developed as a complication.

‡ This small count was the result on only one plate. Premature clotting of the blood prevented making the other two usual plates.

§ A special discussion of case 39 is given in the text under the heading Criticism and Comment.

6. McKernon, J.: New York M. J., April, 1905. Maybaum, J. L., and Goldman, I. B.: Laryngoscope **38**: 569 (Sept.) 1928.

veins. In two of these, however, the numbers were too small to be significant (1 and 2 colonies per cubic centimeter). In the other case (already referred to) there were huge numbers in both jugulars and a very small number in the arm vein.

In twenty-five cases of the whole series, cultures of blood from the arm vein were taken at the same time as those from the two jugulars. Twelve of these cases showed colonies in the agar plates (four additional ones showed growth only in bouillon). In seven of these twelve cases (i. e., in all of the cases in which the bacteremia was from a sinus thrombosis), the number of colonies was decidedly smaller in the arm blood than in one or both jugulars (with one possible exception considered in the discussion of case 38).

In four of the five cases showing approximately equal numbers in the arm and jugular veins the colonies came from infected heart valves, and in the other case the numbers were too small (less than 2 per cubic centimeter) to be significant. There were two cases of transient postmastoidectomy bacteremia. One showed a slight and one a decided preponderance of bacteria in the jugular vein of the side operated on. In both the two internal jugular veins and the arm vein were not taken simultaneously but in rapid succession by one individual. One person (usually the author) drew the blood, handed the syringe to an assistant (who prepared the plates), and proceded to draw blood from the next vein. Thus there was an interval always of seconds and sometimes of minutes between the successive vein punctures.

It is obvious that if a sudden shower of bacteria should be liberated from the infected thrombus while this procedure was going on, one might get differences in the number of colonies in the various veins.

My attention was drawn to this possibility by a recent case (38) of sinus thrombosis in which blood was drawn in rapid succession (at one to three minute intervals) from five different vessels. The results (in the order in which the vessels were aspirated) were as follows:

1. Right internal jugular vein, 1 colony per cubic centimeter of blood.
2. Left internal jugular vein, 45 colonies.
3. Arm vein, 27 colonies.
4. Radial vein or artery, 2 colonies.
5. Radial artery, 1 colony.

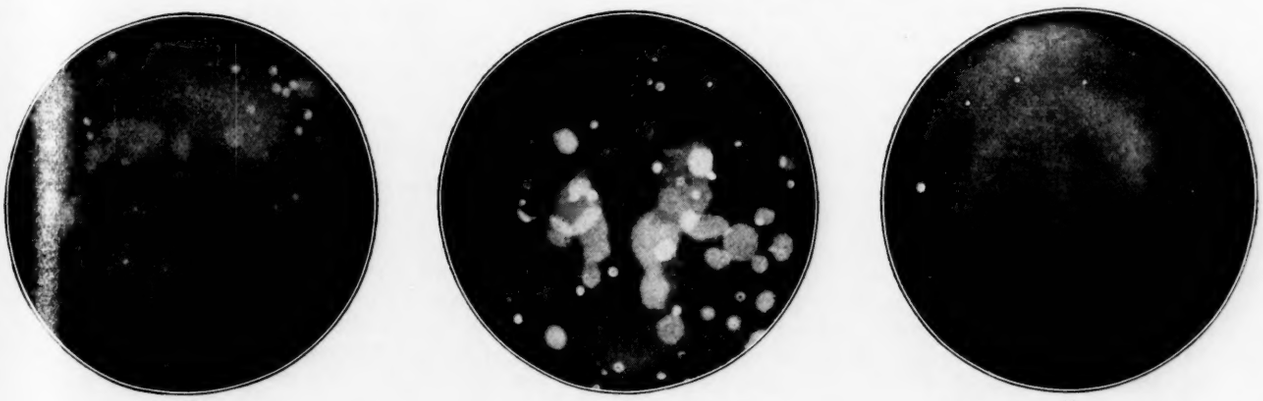


Fig. 3 (case 32).—Blood plates in thrombosis of the right lateral sinus: *A*, culture of blood from the jugular vein of the affected side (right); *B*, culture of blood from the jugular vein of the normal side (left); *C*, blood culture from arm vein (the sharp white spots are bubbles).

lateral sinus had been exposed at operation and presumably there was a mild postoperative phlebitis.

CRITICISM AND COMMENT

It has been shown repeatedly in experiments that bacteria which gain access to the blood stream are removed from the circulation more or less rapidly. Undoubtedly this also happens in human disease, though the evidence for it is mostly indirect. Thus Libman [7] saw the bacteremia disappear in an hour after resection of the jugular vein for sinus thrombosis, even though there had been as many as 72 colonies per cubic centimeter of blood before. Schottmüller [8] states that he has seen the blood in cases of septic abortions swarming with bacteria at the time of a curettage, only to become sterile fifteen minutes later. In a separate paper I have discussed the data in the present study which lead to the same conclusion; namely, that bacteria are rapidly removed from the circulation.

This being so, there is a certain loophole for error in the present study, and before the data are accepted this possibility requires critical consideration. Except in five of the most recent cases, the cultures from the

The reason that the fifth puncture was made was that it was not quite certain whether the blood in the fourth came from a vein or an artery. At subsequent operation a suppurating thrombus was found in the left lateral sinus. Since the number of colonies in the jugular vein of the normal (right) side and in the artery were the same (1 per cubic centimeter) the large number in the arm vein can be interpreted only as a transient shower.

Another case which drew my attention to the possibility that the number of bacteria might be changing while the procedure was going on was case 39, a case of subacute bacterial endocarditis. Here the numbers obtained in the order in which they were drawn were:

1. Right jugular vein, 158 colonies per cubic centimeter.
2. Left jugular vein, 175.
3. Arm vein, 200.
4. Radial artery, 285.

The numbers suggest a progressive liberation of bacteria from vegetations in the heart while the work was going on.

This possibility of the occasional sudden liberation of bacteria from the infected area does not invalidate the general conclusions with regard to sinus thrombosis drawn in the present paper. If the differences observed

7. Libman, Emanuel: J. Michigan State M. Soc. **23**: 462 (Nov.) 1924. Libman, Emanuel; and Celler, H.: Am. J. M. Sc., September, 1909.
8. Schottmüller: Verhandl. Gesellsch. f. inn. Med. **37**: 150, 1925.

had been due to such sudden showers of liberated bacteria, then frequently, or at least occasionally, the largest number of bacteria should have been found in the arm vein, since this was always the last vein to be aspirated.[9] This, however, never occurred (except in the case of endocarditis just described).

Nevertheless, this possible source of error has to be kept in mind. For this reason, for the purposes of the present investigation, I have tentatively modified the technic so as to make the aspiration of the three veins actually simultaneous. This has been possible because two interns have learned to puncture the internal jugular vein successfully. At a given signal, all veins are punctured. So far this has been done five times without any great difficulty. Once it failed because in a small child it took several minutes to find the left internal jugular vein. For further scientific study this simultaneous method will be adhered to, but it is quite possible that when sufficient data have been accumulated the more simple procedure of three punctures in rapid succession by one operator will be found to be adequate for all clinical purposes.

NEGATIVE BLOOD CULTURES

The clinical interpretation of negative blood cultures has hardly been discussed since the papers of Libman [10] in 1908 and in 1912. A peripheral blood culture of the usual type may be negative for a number of reasons which are elaborately discussed by Libman. The one explanation which is most interesting in the present connection is this:

Bacteria which enter the blood stream from the lesion may be filtered out so rapidly that none reach the periphery. This possibility, suggested by several of the cases, is demonstrated by one (case 23) in which postoperative bacteremia occurred after operative exposure and aspiration of a suspected sinus. Though at operation the sinus appeared normal, probably there was an actual if slight and transient phlebitis of the sinus following the exposure. Twenty-four hours after the operation there were in the right jugular vein (the affected side) 24 colonies per cubic centimeter of blood, in the left 7, and in the arm vein none. A blood culture taken as usual from an arm vein would have been reported negative and would have led to the inference that no bacteria were entering the blood stream.

THE NUMBER OF COLONIES

While the actual number of bacteria at a given time in the blood may not have great significance, a progressive change in the number or in the distribution can often be utilized in diagnosis. Thus, in case 4 the differential culture before operation showed 122 colonies per cubic centimeter in the right jugular vein, 7 per cubic centimeter in the left and 6 in the arm vein. Operation showed extensive thrombosis of the left lateral sinus, and the left jugular vein was ligated. The thrombus extended back as far as the knee of the sinus and could not be followed farther on account of severe bleeding. The symptoms continued; cultures taken three days later showed 255 colonies per cubic centimeter in the remaining right jugular and only 22 in the arm vein. The following day there were 356 colonies per cubic centimeter in the right jugular and 78 in the arm vein. The inference was drawn that a thrombus was still present and was extending farther backward in the left sinus. This was confirmed at subsequent operation. An obturating thrombus was found extending a considerable distance past the previous incision toward the torcular Herophili.

A change in the number of colonies in the opposite sense led to an entirely different interpretation in case 20. The patient was a child with congenital cardiac disease who developed symptoms suggesting sinus thrombosis. Here the differential culture from an arm vein made two days before operation showed hemolytic streptococci in a flask but not in the plates. At operation an occluding thrombus of the left lateral sinus was found. After the operation the child continued to show high irregular fever and developed several metastatic foci. Accordingly, three days later a culture was made from the remaining right jugular vein and from the arm vein. The former showed 120, the latter 65 colonies. The slight preponderance of the jugular number suggested that at least some of the bacteria were coming from further thrombi in the sinus, but the difference was not enough to rule out a secondary bacterial infection of the heart valves. The next culture made four days later was conclusive on this point: 258 colonies per cubic centimeter in the jugular, 282 in the arm vein. It was evident that the bacteremia was now due to the endocarditis. At postmortem, extensive bacterial endocarditis engrafted on a cengenital valvular lesion was found along with purulent thrombi in the inferior and superior petrosal sinus and the posterior part of the left lateral sinus.

POSTOPERATIVE BLOOD CULTURES

With regard to blood cultures made soon (from one to three days) after operation on infected regions, my experience in two cases (23 and 41) confirms the previous experience of Libman [11] that such cultures may be positive even though the patient goes on to a smooth recovery. Case 23 (already cited in another connection) also shows that in such cases, even though the blood obtained from the arm is sterile, considerable numbers of bacteria may be draining from the area operated on. It is important to note that in both of the cases of postoperative bacteremia the differential blood cultures were similar to those in sinus phlebitis, and especially important that the sinus had been exposed at operation. In case 23 the sinus appeared normal but was aspirated at operation. In case 41 the sinus was covered with granulations but was not aspirated. Both patients recovered without the jugular vein being tied off or further operative intervention. It seems probable that in both these cases a mild transient postoperative phlebitis of the exposed sinus was responsible for the bacteremia. Whether similar conditions will be encountered after mastoid operations in which the lateral sinus is not exposed, I do not yet know.

SPONTANEOUS RECOVERY FROM SINUS PHLEBITIS

That mild grades of sinus phlebitis can occur and the patient get well without tying off of the jugular vein or operative obliteration of the sinus is well recognized (Hayman,[12] Braun [13]). There was evidence that it occurred in several of my cases. Thus in case 26 there was a slight bacteremia as evidenced by the finding of type III pneumococcus (*Streptococcus mucosus*) in only one of the flasks. At operation a perisinuous abscess was found. The sinus was covered with

9. The veins were invariably aspirated in the same order: (1) right jugular, (2) left jugular. Later when the arm vein was added this was always aspirated last.

10. Libman, Emanuel: Am. J. M. Sc. **136:** 548 (Oct.) 1908.

11. Libman, Emanuel: Bull. Johns Hopkins Hosp. **17:** 225, 1906.

12. Hayman, L., in Denker und Kahler: Handbuch der Hals, Nasen und Ohren Heilkunde **8:** 54.

13. Braun, A.: Lateral Sinus Thrombophlebitis, New York, Paul B. Hoeber, 1928.

granulations and was not opened: the patient recovered. In case 29 there were large numbers of hemolytic streptococci in the blood and the observations were those typical of sinus phlebitis: 34 colonies per cubic centimeter of blood in the right jugular vein, 89 in the left (the mastoiditis was on the left) and 9 in the arm vein. At operation, it was found that the left lateral sinus had become exposed by necrosis of the sinus plate and the sinus itself was covered with granulations. Nevertheless the sinus was not further interfered with and uneventful recovery ensued.

DIFFERENTIAL BLOOD CULTURES IN OTHER REGIONS OF THE BODY

Application of the principle of differential blood cultures to other regions of the body can probably be made. The rather difficult diagnosis of osteomyelitis of the femur in small children, for example, seems a possible field for its use. I have made one attempt in this direction, taking simultaneous cultures from the two femoral veins (which is quite easy) and from an arm vein in a case of osteomyelitis of the fibula. But in this case the cultures were made a day after operation and were sterile.

SUMMARY AND CONCLUSIONS

1. Differential blood cultures are simultaneous blood cultures taken from vessels in several different parts of the body. By counting the number of colonies per cubic centimeter of blood in each vessel, it is hoped to establish from which region the bacteria are entering the blood.

2. That the principle is correct is shown by a study of twenty cases of sinus thrombosis or phlebitis, proved at operation or at autopsy.

3. The principle can undoubtedly be applied to other regions of the body.

4. In a case of suspected sinus thrombosis the finding of a much greater number of bacteria in the blood of one internal jugular vein than in the other confirms the diagnosis. But it is impossible from the count alone to tell on which side the thrombosis is located.

5. The finding of large but equal numbers of bacteria in the two internal jugular veins with a much smaller number in an arm or leg vein also confirms the diagnosis of sinus thrombosis.

6. Totally negative blood cultures from all three veins do not rule out sinus thrombosis.

7. Mild cases of sinus phlebitis in which recovery can occur without tying off of the jugular vein or operative opening of the lateral sinus may occasionally cause a bacteremia of the same type as that in the severe cases.

8. Transient postoperative bacteremia is not infrequent (perhaps the result of transient phlebitis) following operations on the mastoid region in which the lateral sinus has been exposed at operation.

9. The finding of approximately equal numbers of bacteria in the two internal jugular veins and in the arm or leg vein indicates that the bacteria are not coming from the regions drained by any of these veins. In our limited experience (five cases) this finding occurs regularly in bacterial endocarditis, but one might expect it in many other clinical conditions, such as pneumonia or kidney suppuration.

10. From the observations presented it is evident that the lungs and liver filter out enormous numbers of bacteria, so that relatively few of the bacteria which get into the blood stream ever reach the periphery. It would seem, therefore, that in the study of obscure infections blood cultures should be made, wherever possible, from a vein directly draining the involved region. This principle should be applicable to the study of focal infections.

11. The possibility exists that sudden liberation of a shower of bacteria from an infected focus can cause errors in the interpretation of differential blood cultures. It is recommended that for future investigation the multiple cultures be made as nearly as possible simultaneous.

12. The observation that there are sometimes no bacteria detected in the blood of the arm vein, although there are bacteria in the veins directly draining the lesion, leads to the conclusion that the new type of blood cultures ought to be taken early in suspicious cases without waiting for a report of a positive result from an arm vein.

1112 Park Avenue.

PAROXYSMAL TACHYCARDIA IN PREGNANCY *

JACOB MEYER, M.D.
JULIUS E. LACKNER, M.D.
AND
SYDNEY S. SCHOCHET, M.D.
CHICAGO

Paroxysmal tachycardia is defined by Lewis as "a condition in which from time to time the normal mechanism of the heart beat is interrupted by a series of rapid and regular beats varying in rate between 100 and 200 beats per minute, the attacks starting and ending quite abruptly."

The normal impulse to the heart beat originates in the sinus node, or pacemaker, situated at the junction of the superior vena cava and the right auricle. In paroxysmal tachycardia, a new center of impulse formation arises outside the sinus node, in either the auricle or the ventricle, and the rate is much greater than normal. In the ordinary case of paroxysmal tachycardia, the onset is sudden. The patient is perfectly comfortable and may be aware of the increase in the rate of the heart beat or of a fluttering sensation about the heart. The average pulse rate is about 160 and does not change with exertion. This is an essential difference between paroxysmal and simple tachycardia. There is no shortness of breath. The physical signs are negative except for prominent pulsation of the veins in the neck. The heart tones are rapid. Murmurs are usually absent. The heart may not show any change in size. The duration of an attack may vary from one minute to a fortnight. In the more severe forms, dyspnea, cyanosis, pulmonary edema and enlargement of the liver may occur, and the patient may appear moribund. The attack suddenly stops with complete recovery, or the patient may die during an attack.

The causes of paroxysmal tachycardia are not definitely known. It occurs more frequently in males than in females, the ratio being 2:1. It is more common in the young adult of the twentieth and thirtieth

* Read before the Chicago Gynecological Society, Oct. 17, 1929.
* From the Division of Gynecology, Obstetrics and Medicine, Michael Reese Hospital.

year and is frequently associated with rheumatic fever, mitral stenosis and myocardial degeneration. Exertion and emotional disturbances are said to be exciting factors in those predisposed to paroxysmal tachycardia. Flatulence and digestive disorders may also evoke an attack.

It is most striking that the association of paroxysmal tachycardia with pregnancy is not mentioned in standard textbooks, such as Lewis's Clinical Disorders of the Heart, or in De Lee's or Williams' textbooks of obstetrics. In De Lee's textbook there is a paragraph on increased pulse rate and cardiac irregularities in pregnancy, but the author does not speak of paroxysmal tachycardia. Sir James Mackenzie, in discussing paroxysmal tachycardia in pregnancy, does not differentiate it from auricular flutter. Of this he says "I have had no experience of this abnormal rhythm as a complication of pregnancy." However, he describes a case in a young pregnant woman who had attacks of irregular heart beat and who developed attacks of ventricular tachycardia—apparently a case of paroxysmal ventricular tachycardia. In a critical review of the literature only four or five case reports were found of true paroxysmal tachycardia associated with pregnancy

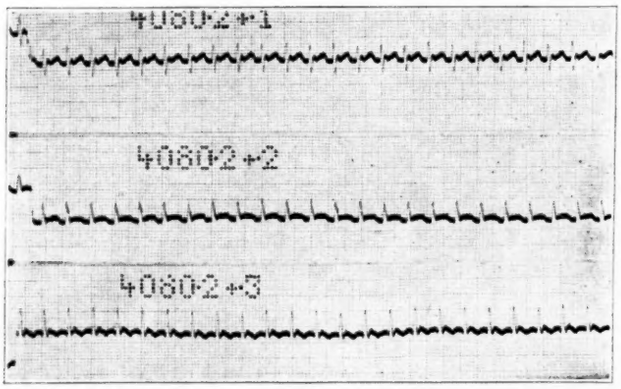


Fig. 1.—Paroxysmal tachycardia in case 1. The pulse rate was 188 a minute.

Of these, Mushillack in 1920 reported two cases with a review of the literature. A case by von Langer from the Kieler Frauenklinik in a young primipara after forty-five and a half hours of labor is recorded in his paper. The first impression by the obstetrician was that of hemorrhage, but the general condition of the patient was excellent and recovery resulted. This author also mentions two other cases of shock (reported by Wallich) at the termination of a normal labor, which he considers paroxysmal tachycardia. In one of the cases the diagnosis of internal hemorrhage was disproved by laparotomy, and in the other case the symptoms of "shock" disappeared in too short a period. One of the cases reported by Mushillack was in a primipara, aged 23, in labor three hours with normal delivery. After delivery of the placenta, a loss of only 600 cc. of blood occurred. The pulse was rapid and thready. Internal hemorrhage was considered, but when the uterus was felt it was firm and contracted and there was no visible external hemorrhage. The general condition of the patient was good and there was no dyspnea. The pulse rate at this time was 180. The condition continued for one hour and then suddenly stopped.

The second case occurred in a quintipara, aged 34, with a history of repeated "heart attacks." The patient was admitted to the clinic with the diagnosis of concealed hemorrhage or a premature separation of the placenta. The pulse rate of the patient was 160, but the fetal heart tones were of normal frequency and of good quality. Forty-five minutes after the onset, the attack subsided and the pulse rate dropped to 80. One hour and thirty minutes later there was a recurrence of the attack. Delivery in this case was normal.

F. M. Whyte reports an interesting case of delivery during an attack of paroxysmal tachycardia in a quadripara, aged 35, with a history of repeated attacks of paroxysmal tachycardia for the past eighteen years. A mitral stenosis was also present. In spite of the fact that the patient had been taking quinidine for the past two years, the attacks of tachycardia occurred more frequently. An attack of tachycardia occurred at 1 a. m., and at 1:30 labor began; at 2 p. m. normal delivery occurred. Dyspnea in the mother was marked. There was no sign of asphyxia in the child. The placenta was delivered at 2:15 p. m. with the normal amount of blood loss. Immediately after delivery of the placenta the mother showed signs of "collapse." The pulse was 240, and respiration was rapid. Digitalis and digalen were administered without results. On the following morning the patient appeared moribund; the face was alternately gray or cyanotic. The following day the pulse was 280; edema of the lungs and enlargement of the liver were present. Quinidine, 1½ grains (0.1 Gm.), and morphine, one-fourth grain (16 mg.), were administered. The next morning the pulse was 120 and the condition was good. The subsequent course was uneventful. This case is presented in detail because it clearly shows a picture of true paroxysmal tachycardia during labor and resembles the cases of so-called shock reported by Wallich.

REPORT OF CASES

CASE 1.—Mrs. A. Z., aged 28, a nullipara, six months pregnant, was admitted to the service of one of us (S.) with a history of extreme weakness, marked irritability and loss of weight. The patient was definitely neuropathic and had had several "nervous breakdowns," so that the clinical impression of hyperthyroidism might have been given. February 20 the patient was examined and was apparently comfortable except for indisposition and irritability due to a cold. Thirty minutes later the patient suddenly felt her heart "pounding," was faint, and complained of a sense of constriction about the chest.

The patient was hospitalized. The pulse on admission was 138. Physical examination revealed extreme nervousness and moderate dyspnea, with the pulse at the apex and at the wrist 180. A moderate exophthalmos and an enlarged right lobe of the thyroid gland were noted. The heart was 10 cm. to the left of the midsternal line, and the right border was about 4.5 cm. from the midsternal line. The heart tones were rapid and regular; a faint systolic (?) murmur was heard at times and the second pulmonic sound was accentuated. There were no abnormalities in the lung. The patient was fairly comfortable. The clinical impression was that of paroxysmal tachycardia. The electrocardiogram (fig. 1) confirmed this impression.

The following morning the condition continued without any marked change. Vagus pressure, change in position and other remedies, including tincture of digitalis, were tried without effect. On the third day of the attack an irregularity of the radial pulse was noted. Cyanosis of the lips was marked, and numerous râles appeared in the base of the lungs. Tincture of digitalis was increased to 30 minims (2 cc.) every four hours. The heart extended 4.5 cm. to the right and 12 cm. to the left of the midsternal line. On the fourth day of the attack the heart rate at the apex was 200 and dyspnea was marked. Râles were heard at the right lower lobe, and the liver was tender and enlarged. The condition of the patient

did not look favorable. At 5:25 p. m. of this day the pulse rate was 200. It is a matter of common knowledge that these attacks may be abruptly ended by reflex inhibition produced by pressure on the vagus or sudden sneezing or coughing. It occurred to one of us to try snuff.

The patient coughed rather severely when the snuff was given, pressure being exerted on the vagus at the same time, and suddenly the pulse dropped to 90. The general condition of the patient improved; there were no recurrent attacks, and she was discharged on the tenth day. The diagnosis was

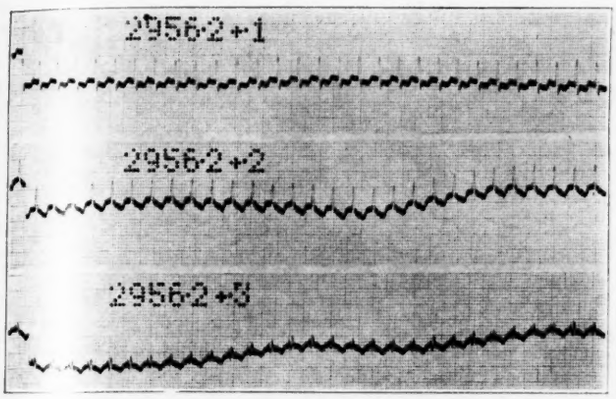


Fig. —Electrocardiographic tracing made June 27, 1928, in case 2. The tachycardia was probably of nodal origin, although it was impossible to say definitely whether it was nodal or auricular. The T wave is inverted in all leads. The pulse rate was 200.

twin pregnancy, paroxysmal tachycardia and possible mitral stenosis with an early myocardial insufficiency due to this severe attack of paroxysmal tachycardia. She was advised as to her condition and told to report any attacks. She was observed by the obstetrician and internist during the succeeding months of pregnancy.

In the thirty-sixth week of pregnancy the patient was hospitalized in order that labor might be terminated. The heart at this time was 10.5 cm. to the left of the midsternal line and 4.5 cm. to the right. A presystolic murmur was heard and the pulmonic second sound was sharply accentuated. There was no pulmonary congestion or enlargement of the liver. The pulse was 90.

In view of the previous severe attack of paroxysmal tachycardia, with definite evidence of early decompensation and of symptoms pointing to mitral stenosis, and the associated twin pregnancy in a neuropathic type of patient, it was deemed inadvisable to submit her to the test of labor. A low cervical cesarean section was performed under local anesthesia. There was no severe hemorrhage and two normal female infants were delivered. The uterus was closed in the routine manner (interrupted sutures). The patient was sterilized by excision of the cornua of the tubes and the pelvic toilet was completed. The abdominal wall was closed. The patient left the operating room in good condition. Her postoperative progress was uneventful. At the time she was discharged from the hospital, the heart condition was improved and there were no recurrent attacks of tachycardia.

CASE 2.—Mrs. B. E., aged 31, was admitted to the medical service of Dr. Solomon Strouse in April, 1927, because of recurring "heart attacks." The patient dated her attacks from a severe case of scarlet fever, followed by "rheumatism." These "heart attacks" were often associated with severe pain in the precordium simulating angina. During the time the patient was observed in the hospital, attacks of paroxysmal tachycardia occurred varying in duration from three hours to two days. The pulse rate was 200, and the electrocardiograms showed tachycardia of nodal or auricular origin. The heart measured 10 cm. to the left of the midsternal line and 4 cm. to the right. The second pulmonic sound was accentuated; there were no murmurs. Roentgen examination of the heart showed a mitral configuration.

In August, 1927, the patient was readmitted to Michael Reese Hospital with a similar complaint. In the interval she had had several attacks of paroxysmal tachycardia and was admitted on the fourth day of a similar attack. Physical examination showed a moderate increase in the transverse diameter of the heart. The right border was 5 cm. from the midsternal line and the left border 13.5 cm. The electrocardiogram revealed paroxysmal tachycardia.

June 17, 1928, approximately ten months later, the patient, in her third pregnancy, was admitted to the service of Dr. Lackner. A normal delivery occurred two hours after her admission to the hospital. Two days later, June 19, the patient complained of severe pain in the epigastrium, radiating to the precordium and then down to the left arm. The patient recognized the nature of the attack. The pulse at this time was 180. The next morning she was seen by Dr. Sidney Strauss, who confirmed the diagnosis. This attack continued for six days, with a remission for only eight hours. The pulse rate was 200. The heart borders measured 4.5 cm. to the right of the midsternal line and 12 cm. to the left. The liver was enlarged and tender; the pulsations in the neck were visible. The electrocardiogram (fig. 4) showed paroxysmal tachycardia. It was difficult to say whether it was nodal or auricular in origin. She was discharged to the cardiac clinic, July 7, 1929.

In November, 1929, the patient was readmitted to the service of Dr. W. W. Hamburger because of recurring attacks and increased shortness of breath. The patient believed that the attacks were more severe. Examination showed cyanosis of the lips, edema of the extremities and an enlarged liver. The heart was 3.5 cm. to the right of the midsternal line and 11.5 cm. to the left. The clinical diagnosis was organic heart disease, cardiac enlargement with recurring attacks of paroxysmal tachycardia and moderate heart failure.

DIAGNOSIS

For the obstetrician it is important to recognize this condition not only during pregnancy but also during or after labor. In pregnancy the condition is often confused with simple palpitation and other conditions causing a rapid pulse, such as hyperthyroidism and pulmonary tuberculosis. In the case of simple palpitation the onset of the tachycardia may be sudden but recovery is always gradual, the pulse dropping slowly to normal, and this slowing of the heart can again be increased by exertion. In paroxysmal tachycardia, the

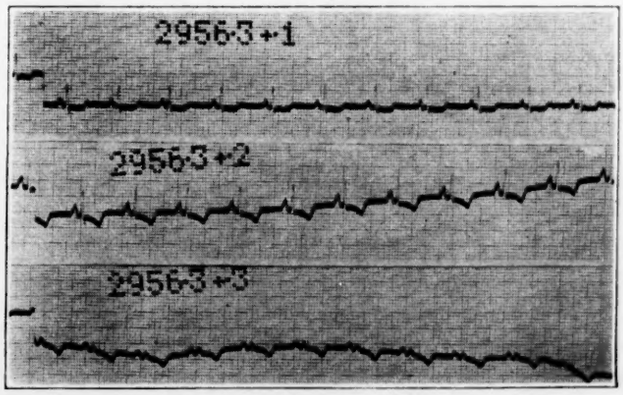


Fig. 3.—Electrocardiographic tracing, June 28, showing sinus rhythm and a rate of 79. The P-R interval is 0.16 second. The T wave tends to be diphasic in lead 1; the T waves in leads 2 and 3 are markedly inverted, probably a digitalis effect. The P wave is abnormal in all leads, especially the second. Compared with the preceding curve there is a return to sinus rhythm, but the evidence of auricular disease is still present.

pulse rate increases suddenly and drops abruptly, and exertion does not affect it. In hyperthyroidism the pulse, though regular and rapid, is increased by exertion and emotion. During labor or after labor it is important to differentiate paroxysmal tachycardia from internal hemorrhage, premature separation of the placenta, "shock," and massive collapse of the lung.

The symptoms of these conditions are familiar enough to the obstetrician and need not be described.

TREATMENT

Attacks of paroxysmal tachcardia may cease spontaneously. They may be relieved by reflex inhibition or by direct pressure on the vagus, or may be induced by deep breathing, coughing, belching or catharsis. The use of quinidine sulphate has now been tried by many and is reported to give good results. Digitalis and digitalin likewise have been reported as giving prompt relief.

It is a matter of common knowledge that the paroxysms may end abruptly without any medication or care, and it is therefore difficult to evaluate the therapeutic results. It is not possible to predict the duration of an attack, its recurrence, or how it will terminate. Some of the cases terminate fatally. In the majority of the cases of paroxysmal tachycardia, however, the condition is well tolerated. How to evaluate the condition of the myocardium is the problem of the internist. He may be guided in some measure by the previous history and the association of evidence of valvular disease or clinical signs of myocardial failure.

Lewis, in discussing the prognosis of paroxysmal tachycardia, says "The attacks themselves indicate muscle damage, and the attacks are apt to place the life of the patient in jeopardy."

The prognosis should always be guarded. With these facts before the obstetrician, the question as to how to proceed in pregnancy and in labor may justly cause some degree of concern. At the outset, we wish to caution against the use of quinidine during pregnancy. It has been shown that quinidine has oxytocic properties and it is reported that it is five times more active on uterine strip than quinine.

In the normal case of pregnancy, with a history of repeated attacks of paroxysmal tachycardia without evidence of myocardial or valvular disease, the patient

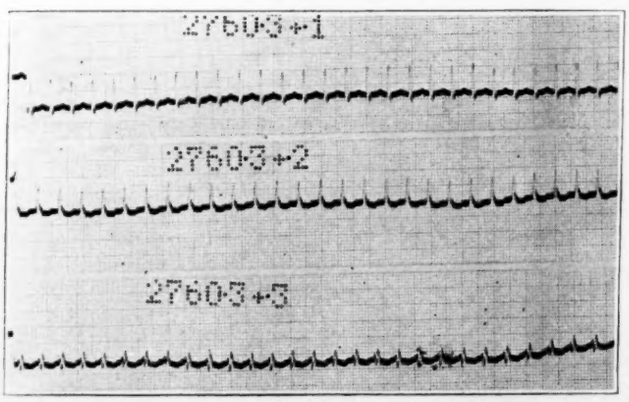


Fig. 4.—Paroxysmal tachycardia of nodal origin, with a rate of 214, Oct. 23, 1929, in case 2.

may be allowed to go to term and delivery without intervention; but the second stage in some cases should be shortened. It is well to remember the association of paroxysmal tachycardia with mitral stenosis. It is evident, then, that the same routine prescribed in pregnancy and in mitral lesions should be followed in cases of paroxysmal tachycardia. When the history points to severe repeated attacks associated with definite evidence of myocardial or valvular disease or evidence of dilatation with pulmonary edema and enlargement of the liver, normal delivery should not be permitted. Attacks during labor or post partum necessarily present grave difficulties. Cardiac stimulants, digitalis or strophanthin, ouabain and morphine may be of value.

SUMMARY

In the present report we direct attention to the occurrence of paroxysmal tachycardia in pregnancy and labor. It is conceivable that the various factors in both states may be of etiologic significance in the development of attacks of paroxysmal tachycardia. This is more likely in an individual who has had previous attacks or a myocardial lesion.

The recognition of paroxysmal tachycardia in pregnancy should put the obstetrician on his guard as to its possible recurrence during labor. The decision as to the time and method of terminating pregnancy is to be determined in each case by evaluating as far as possible the condition of the myocardium and the duration and severity of previous attacks.

Paroxysmal tachycardia is to be differentiated from complications in labor, such as internal hemorrhage, premature separation of the placenta, concealed hemorrhage, shock or massive collapse of the lung.

55 East Washington Street.

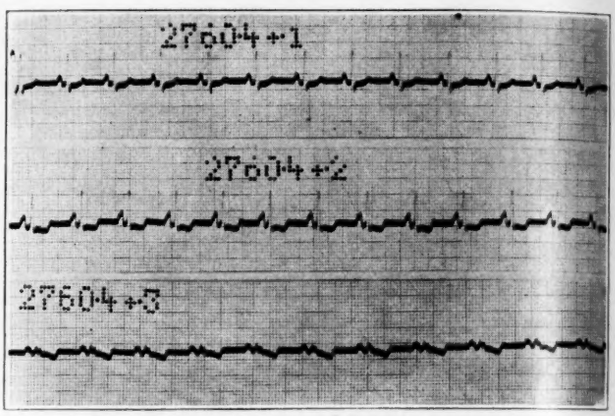


Fig. 5.—Electrocardiographic observations, October 25, in case 2, showing sinus rhythm and a rate of 94. The P-R interval is 0.14 second. The P wave is notched in all leads. The T wave is diphasic in lead 2 and is inverted in lead 3. The curve suggests auricular myocardial disease.

Children of Choice.—I believe that every person dying under the age of 20 is an economic failure. Nature weeds out the unfit, and enormous sums of money are spent yearly in thwarting Nature, but in the long run progress must be established and Nature gets her way. R. J. Ewart recorded in the *Eugenics Review* how a few wet summers had enormously reduced the death rate from infantile diarrhea, but an epidemic of measles came along and wiped out all the inefficient lives that had been saved. War is dysgenic, and in the late great war millions of the fittest of the fit were killed. While our A 1 men were sacrificing life and limb the weaklings at home were propagating the race, but Nature was not going to be thwarted all the time; she came along with a world-wide epidemic of influenza and wiped out more of the weaklings than the numbers of the fit killed in the war. If you want an A 1 race you must breed it; there is no other way. You must apply genetics to the human race just as you do to the lower creation. We want children of choice, not of chance, which is the usual haphazard method in the present day. Those who cannot produce healthy children should leave the job to those who can.—Barr, Sir James: Preservation of a Healthy and Efficient Circulatory System from Childhood to Advanced Age, *Brit. M. J.*, April 26, 1930.

BRUCELLOSIS

I. THE SIGNIFICANCE OF BRUCELLA AGGLUTININS IN THE BLOOD OF VETERINARIANS *

I. FOREST HUDDLESON, D.V.M.
AND
HOWARD W. JOHNSON, M.S.
EAST LANSING, MICH.

There is overwhelming evidence that *Brucella abortus* Bang is capable of producing a disease in certain individuals not unlike that produced by *Brucella melitensis* Bruce. If *Brucella abortus* is highly pathogenic for man, why should not the disease be found in a large number of veterinarians whose occupation necessitates frequent contact with infective material such as aborted fetuses and retained fetal membranes? This has been a moot question for some time and its answer, in the absence of any experimental evidence whatever, has been highly speculative. There is no group of individuals that comes into contact more often with as large a quantity of and as virulent *Brucella abortus* infective material as do practicing veterinarians; and if this species of *Brucella* is anywhere near as highly pathogenic for man as the other two species of this genus, namely, *Brucella suis* Traum and *Brucella melitensis,* we should expect to find as large a percentage of them infected or presenting a history of having had the disease as the percentage of laboratory workers who have become infected from working with the two latter species.

In view of the lack of information on the question, it seemed highly probable that some clue to its answer might be gained by examining the blood of a large group of veterinarians for *Brucella* agglutinins and questioning them as to their past history as regards clinical manifestations of the disease. During a recent conference of Michigan veterinarians at the Michigan State College, an opportunity was presented to acquire some light on the subject. The results proved to be interesting and enlightening.

Altogether, blood specimens of forty-nine practicing veterinarians were examined for agglutinins by means of the rapid method. Of these, fifteen agglutinated the antigen completely in a 1:50 dilution; six in a 1:100 dilution; three in a 1:200 dilution, and four in a 1:500 dilution; twenty-one specimens were negative. In other words, 57 per cent of those examined showed agglutinins in their blood and 26 per cent showed agglutinins in a titer (1:100 and above) that is generally accepted as indicating active infection.

When the individuals who were tested were questioned as to their past or present clinical manifestations of undulant fever, only three gave a past history of a symptom complex characteristic of the disease. One gave a history of having had the disease in 1924, one in the spring of 1929 and one in the fall of 1929. The blood of the one giving a history of the disease in 1924 was tested in 1928 and reacted in a 1:50 dilution. The titer was the same with the present test. The serum agglutination titer of the other two was 1:100.

These agglutination reactions in the twenty-eight veterinarians do not lend themselves to easy interpretation, because subjects under test cannot say positively that they have not had undulant fever. They may have had an attack of the disease of so mild a nature that it came and went without causing noticeable disturbance to their health. On the other hand, it is doubtful whether they ever showed any clinical symptoms of infection. Evidence that tends to substantiate this point is apparent in the histories of two of our veterinary students. One of these was engaged in assisting a veterinarian in practice during the summer of 1929. On several occasions he assisted in the removal of retained fetal membranes of aborting cows. An agglutination test made on his blood serum in December, 1929, showed a titer of 1:500. He had felt no illness during the summer or fall. Feb. 15, 1930, the agglutination titer had fallen to 1:100.

The other student has assisted in the testing of blood specimens of cows for *Brucella abortus* agglutinins since December, 1929. His blood was examined for *Brucella* agglutinins, Dec. 23, 1929. The test was negative. Feb. 4, 1930, he developed a slight tonsillitis and cold. There was no elevation of temperature during the period of the cold. The agglutinin titer of the blood serum at this time was 1:200. February 17, the titer was slightly above 1:50.

The presence of *Brucella* agglutinins in the blood of these two students is fairly certain evidence that they have been in contact with infective material. Their failure to develop the disease may have been due to either of two factors, operating separately or together; namely, low pathogenicity for human beings of the strain of organism in the infective materials or native resistance of the two individuals to *Brucella.*

In the light of the results obtained in the large group of veterinarians, it is reasonable to assume that both of the factors just mentioned are responsible for the failure not only of the two students to develop a symptom complex like that of undulant fever but also of the many thousands of people who drink raw milk containing *Brucella abortus* Bang. In other words, *Brucella abortus* Bang has invasive properties for human beings, as is evidenced by the presence of specific agglutinins in the blood of those who come in direct contact with a large amount of infective material; but the germ has low pathogenicity, as is evidenced by the small number who develop the disease after direct contact with the organism.

This assumption has support in the infective milk feeding experiment conducted by Cooledge [1] in 1916; in the experiments on monkeys conducted by Fleischner, Vecki, Shaw and Meyer; [2] by Burnet,[3] and by Huddleson and Hallman,[4] and in the recent experiments on human beings reported by Otero,[5] in which he failed to induce symptoms of undulant fever by feeding cultures of *Brucella abortus* Bang.

The observations presented in this paper, together with the results of the investigations just mentioned, serve in a large measure to clarify the position of *Brucella abortus* Bang as regards its pathogenicity for human beings. Its position as one of the species of *Brucella* that cause undulant fever in man has already

* Journal article 33, Michigan State Experiment Station.
* From the Central Brucella Station, Department of Bacteriology, Michigan State College.
* This work was done under a grant from the committee on infectious abortion of the National Research Council.

1. Cooledge, L. H.: Is Bact. Abortus Pathogenic for Humans? J. M. Research **34**: 459 (July) 1916.
2. Fleischner, E. C.; Vecki, M.; Shaw, E. B., and Meyer, F. K.: The Pathogenicity of B. Abortus and B. Melitensis for Monkeys, J. Infect. Dis. **29**: 663 (Dec.) 1921.
3. Burnet, E.: Experiments on the Pathogenic Powers of M. Melitensis and B. Abortus for the Monkey and Man, Compt. rend. Acad. d. sc. **187**: 545 (Sept. 24) 1928.
4. Huddleson, I. F., and Hallman, E. T.: The Pathogenicity of the Species of the Genus Brucella for Monkeys, J. Infect. Dis. **45**: 293 (Oct.) 1929.
5. Otero, P. M.: Experimental Infection of Brucella Abortus in Man, Porto Rico J. Pub. Health & Trop. Med. **5**: 144, 1929.

been made clear by its isolation from the blood of many ill people in various parts of this country and northern Europe. Now its position with reference to the degree of its pathogenicity for human beings seems to us to be much clearer. For the vast majority of people it is not highly pathogenic, but there appears to be a definite number in the minority group who, when exposed to a sufficient amount of *Brucella abortus* Bang infective material, develop undulant fever. Since there is yet no means other than known exposure to infection by which those susceptible to infection can be distinguished from those not susceptible, it is advisable that every one guard against undue exposure to material containing *Brucella abortus* Bang as well as the other two known species of this genus.

The apparent immunity of many persons to *Brucella abortus* infection is quite similar to what one finds in respect to resistance to *Brucella melitensis* infection in the Mediterranean littoral. Of the people who are exposed to infection by way of goat's milk, many more do not become infected than do develop infection. The origin of the immunity on the part of so many human beings to *Brucella* is a subject of considerable importance and should not be neglected in future studies of the problem.

CUTANEOUS HYPERSENSITIVENESS TOWARD BRUCELLA

For several years, veterinarians have informed us that a peculiar erythema develops on the skin of their arms following contact with the vagina of certain cows, particularly those that have aborted. The number of cases of this condition have become so numerous that we decided to make a thorough investigation of it during a recent conference of Michigan veterinarians held at the Michigan State College to determine the extent of its occurrence, the exact symptoms and the cause.

Of fifty practicing veterinarians questioned, ten, or 20 per cent, stated that a cutaneous rash appeared on the arm after it had been inserted into the vagina of certain cows in sterility practice or in the removal of retained fetal membranes. They were of the opinion that the rash appeared only when they worked on animals infected with *Brucella abortus*.

The erythema makes its appearance, usually on the lateral surface of the forearm, in about twenty minutes after contact with the mucous surface of the vagina of the cow.

Two types have been observed. The extent of the sensitiveness of the individual determines the type of erythema. In one type, light red, irregular blotches appear on the skin, or the entire surface of the forearm may become a light red. When viewed closely, these blotches appear as minute reddish points slightly separated, while from a distance they have the appearance of an erythema. They are not elevated. The skin becomes discolored on firm pressure. There is an intense itching or burning sensation. The discoloration disappears in from four to eight hours. There is no exudation or desquamation.

In the second type the rash appears as small discrete elevated reddish papules which are more widely separated than in the first type. The accompanying itching and burning sensation is very severe. The papules often persist for three or four days. Their color changes to a dark brown. There is no exudation or desquamation.

In order to determine whether there was any relation between the cutaneous symptom and contact with *Brucella abortus* or products of the growth of *Brucella abortus*, blood specimens were collected from five of the men and examined for *Brucella* agglutinins. The blood of three of the men agglutinated *Brucella* in a titer of 1:50 and two in a titer of 1:100. They, as well as four others whose blood showed *Brucella* agglutinins, were given an intradermal test, the bouillon culture filtrate method described by Burnet [6] being used, except that the culture from which the material was prepared was *Brucella suis* Traum of human origin.

In the men showing cutaneous hypersensitiveness, the intradermal test produced a local reaction at the point of injection and a very severe constitutional reaction, not unlike the typical symptoms of undulant fever, which persisted from twenty-four to forty-eight hours. In three of the other men, a local reaction was elicited and a mild but uncomfortable constitutional reaction. One of these, showing serum agglutinins in a 1:500 dilution, failed to react to the intradermal test.

The test is made by injecting 0.05 cc. of the fluid intracutaneously with a small gage needle high up on the lateral surface of the forearm. In those that show skin hypersensitiveness, the reaction takes the following course: About five minutes after the injection of the fluid, an erythema appears around the point of puncture. In the course of from one to two hours, it has spread outward to a diameter of from 3 to 6 inches, or it may cover the lateral surface of the arm. At the end of two hours there is a noticeable elevation of the skin at and around the point of puncture. It has usually reached its maximum diameter of about 4 inches by the sixth hour. The local reaction may persist for forty hours. Desquamation of the skin over the edematous area may follow. The constitutional reaction begins at about the sixth hour after the injection and may persist from twenty-four to forty-eight hours. There is a feeling of general malaise and dulness followed by a severe chill, an elevation of temperature of 1 or 2 degrees, sweating, insomnia, pains in the muscles, joints and intestine, a swollen and painful axillary node, nausea and vomiting.

In others that react to the intradermal test but do not experience skin hypersensitiveness, a slight erythema appears at the point a few minutes after injection and then disappears. It makes its appearance again at the sixth to eighth hour accompanied by a circumscribed elevation or edema of the skin which increases in size until it reaches a diameter of from 3 to 5 inches. The local reaction may persist over a period of forty hours and then gradually disappear. There is no desquamation of the skin over the area involved. The constitutional reaction varies in degree in different individuals. It begins at about the sixth hour with a feeling of dulness, followed by a short chill, a slight rise in temperature, and a swollen axillary node and mild headache. The reaction passes off in about fifteen to twenty hours.

A local and constitutional reaction such as the one just described can also be elicited in those that have or have had undulant fever and in many individuals who have worked with the organism in the laboratory, regardless of whether they show specific agglutinins in their blood.

6. Burnet, E.: Diagnostic de la fièvre méditerranéenne par introdermoreaction: Action du filtrat de culture du M. melitensis, Arch. de l'Inst. Pasteur de l'Afrique du Nord., 1922, p. 187.

The intracutaneous injection of the broth filtrate apparently elicits a reaction in those whose tissues have in some manner become sensitive to *Brucella* protein, because in those who give no history of past infection or of having been in contact with infective material no local or constitutional reaction follows.

The reaction elicited by means of the intradermal test in those veterinarians showing skin hypersensitiveness is therefore quite conclusive evidence that this symptom is due to *Brucella abortus* protein, against which they have in some manner become hypersensitive. It is proposed that the skin symptom be designated in medical nomenclature as "erythema brucellum."

INCIDENCE OF RAGWEED POLLEN IN UNITED STATES DURING 1929 *

O. C. DURHAM
INDIANAPOLIS

A national atmospheric pollen survey is the natural outgrowth of the rapidly increasing interest in local pollen research. Such an investigation should naturally begin with ragweed, on account of its unquestioned preeminence as a national allergic nuisance. It is my purpose in this paper, not only to picture the conditions that annually confront fall hay-fever sufferers of the United States, but to present in a simple manner the effect of the more important factors influencing the production and distribution of ragweed pollen. Since the work is to be repeated during 1930, little attempt will be made to evaluate these various factors. Even where correlations are plotted, only the most obvious conclusions are drawn. Suggested explanations must in most cases wait for further confirmation.

In comparative studies [1] conducted by private local cooperation it has been impossible to standardize the technic of air "sampling." This difficulty was practically solved in this study by securing the cooperation of the United States Weather Bureau in exposing pollen slides in all sections of the country during the season of 1929. Conditions and methods well calculated to produce uniformity in the meterological records of the United States Weather Bureau were utilized in securing this by far the most abundant and accurate mass of facts so far collected on the atmospheric distribution of ragweed pollen in the United States. The possibility and accomplishment of this investigation are due entirely to the courtesy of Dr. Charles F. Marvin, chief of the United States Weather Bureau, and his assistant, Dr. C. C. Clark, and to the faithful cooperation of the local meterologists working under them.

The number and choice of stations was determined by the results of previous air surveys, the relative density of population, field observations that I made in all parts of the United States, and the necessity of limiting the gross amount of work involved.

METHODS

Local meterologists in twenty-eight cities were furnished with uniform exposure apparatus, materials and instructions, and work was started, August 10, continuing in all stations until September 30 and in the southern stations until October 31. As in previous studies, petrolatum-coated slides were exposed, oiled side up, for twenty-four hours,[2] and changed daily at 8 a. m., Eastern Standard Time. The site of exposure at each station was a point under the false roof of the standard instrument shelter. At weekly intervals the slides were shipped to me, and I made all the counts. The technic of counting was the same as that used in 1927 [3] and 1928, the unit area counted being 1.8 square centimeters of slide surface.

Pollens of all members of the ragweed family (*Ambrosiaceae*) were counted, including not only the true ragweeds (*Ambrosia*), but marsh elders (*Iva*), cocklebur (*Xanthium*) and false ragweeds (*Franseria*). No record was made of other pollens than ragweed, but it is safe to say that in stations east of the Mississippi River ragweed pollen constitutes 98 per cent of the atmospheric load during August and September, and even in the western stations studied, ragweed pollen was the predominating variety.

Of the ragweeds, only cocklebur and burweed marsh elder (*Iva xanthifolia*) pollens are readily distinguished from those of the rest of the group, so no effort was made to determine accurately the part played by each member of the family. However, it is certain that the common short ragweed (*Ambrosia elatior*) contributes considerably more to the atmospheric total than all other species combined. Even giant ragweed, whose ability to produce pollen is unmatched by any weed, on account of its restricted acreage is not more than half as important as short ragweed. Its apex of production occurs in the Central states at least ten days before the apex of atmospheric pollen concentration. The geographic distribution of the more common species of ragweed is shown in table 1.

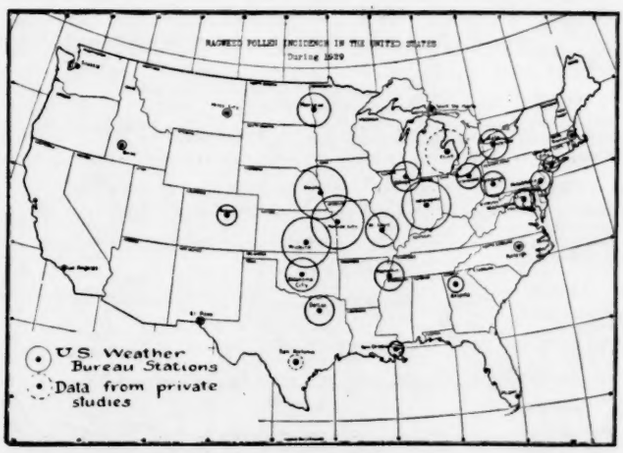


Fig. 1.—Relative abundance of the ragweed pollen in twenty-eight cities included in the 1929 study as shown by total atmospheric counts throughout the season. The coincidence of the "corn belt" and the "ragweed belt" is striking. Area of circles shows relative total of pollen falling on slides during the season. Map reproduced by permission of National Map Company, Indianapolis.

The dependability of the observations in this study may best be judged by comparing this year's figures

---

* From Biological Laboratories, Swan-Myers Company.

1. Durham, O. C.: Cooperative Studies in Ragweed Pollen Incidence, J. Allergy **1**: 12 (Nov.) 1929.

2. Since this paper was written, a method of exposure has been suggested (Penfound, W. T., and Efron, B. G.: A Standardized Method for Pollen Air Analysis, Proc. Soc. Exper. Biol. & Med. **27**: 650-654 [April] 1930) by which simultaneous exposures are made with a slide in the horizontal position and another in the vertical position, with the vertical slide kept, by a wind vane, at right angles to the direction of the wind. That results on such a vertical slide are of no value is evident from the fact that a plane at right angles to a current of air sets up eddies which carry most air-borne particles around it. If an oil coated slide is fastened to the front of the windshield of an automobile and exposed all day in cross country travel, very little pollen is deposited. It is a well known fact that dust particles in the air do not adhere to the windshield of a car but to the rear of the body. By analogy, more pollen would be deposited on the back surface of a vertical slide than on the surface facing the wind.

3. Durham, O. C.: The Contribution of Air Analysis to the Study of Allergy, J. Lab. & Clin. Med. **13**: 967 (July) 1928.

with those for other years,[1] secured under similar conditions, and by comparing results in private studies in a given place with those secured through the weather bureau survey. As an instance of this, we offer our experience in New York this season. Besides the

TABLE 1.—*Distribution of Principal Species of Ragweed Contributing to 1929 Study* *

	Short Ragweed, Ambrosia elatior	Giant Ragweed, Ambrosia trifida	Southern Ragweed, Ambrosia bidentata	Western Ragweed, Ambrosia psilostachya	Cocklebur, Xanthium spp.	Marsh Elder, Iva ciliata	Burweed Marsh Elder, Iva xanthifolia	Poverty Weed, Iva axillaris	High Water Shrub, Iva oraria	Narrow-Leaved M. E., Iva angustifolia	Seacoast Marsh Elder, Iva imbricata	False Ragweed, Franseria acanthicarpa	Slender False Ragweed, Franseria tenuifolia
Eastern													
Boston	+	..	..	..	—	..	..	..	—	..	..	..	..
New York	+	+	..	..	—	..	..	..	—	..	..	..	..
Philadelphia	+	+	..	..	—	..	..	..	..	..	..	..	..
Washington	+	+	..	..	—	..	..	..	..	..	..	..	..
Raleigh	+	—	..	..	—	..	..	..	..	..	..	..	..
Southeastern													
Atlanta	+	+	..	..	—	..	..	..	..	..	..	..	..
Miami	—	..	..	..	..	..	..	..	..	..	—	..	..
Great Lakes													
Sault Ste. Marie	—	—	..	...	—	..	..	..	..	..	..	..	..
Buffalo	+	—	..	..	—	..	..	..	..	..	..	..	..
Cleveland	+	—	..	..	—	..	..	..	..	..	..	..	..
Pittsburgh	+	—	..	..	—	..	..	..	..	..	..	..	..
Chicago	+	+	..	..	—	..	—	..	..	..	..	..	..
Central													
Indianapolis	+	+	..	..	—	..	..	..	..	..	..	..	..
St. Louis	+	+	+	..	—	—	..	..	..	..	..	..	..
Memphis	+	+	+	..	—	+	..	..	..	..	..	..	..
Plateau													
Boise	..	..	..	..	—	..	—	—	..	..	..	—	..
Miles City	—	..	..	..	—	..	—	—	..	..	..	..	..
Denver	+	—	..	—	—	..	+	—	..	..	..	+	..
El Paso	..	..	..	—	..	..	—	—	..	..	..	..	—
Plains													
Moorhead	+	+	..	..	—	..	—	..	..	..	..	..	..
Omaha	+	+	..	—	—	..	+	..	..	..	..	..	..
Kansas City	+	+	—	—	—	—	+	..	..	..	..	..	..
Wichita	+	+	..	—	—	+	..	..	..	..	..	..	..
Oklahoma City	+	+	..	—	—	—	..	..	..	..	..	..	..
Southern													
Dallas	+	+	..	..	—	+	..	..	..	—	..	..	..
New Orleans	+	+	..	..	—	+	..	..	..	..	..	..	..
Pacific													
Seattle	..	..	..	..	..	..	..	..	..	..	..	..	..
Los Angeles	..	..	..	—	..	..	..	—	..	..	..	—	..

* The symbol + is used to designate more important; —, less important.

slides exposed in New York at the Central Park Weather Bureau Station, I counted two series exposed by independent workers, one at a point just east of Central Park (Maximilian A. Ramirez, M.D.) and one at Coney Island (Charles A. Spivacke, M.D.). Not only did these two studies agree within 10 per cent with the weather bureau study in the total amount of pollen encountered, but the apex occurred on the same day in each case and the fluctutations were consistent throughout. The average of the three New York studies this year varies less than 8 per cent from the record of the two previous seasons.

PRESENTATION OF DATA

The basic facts gathered in this investigation, daily pollen fluctuations at all stations, are presented in a series of twenty-four graphs, one for each active station. These are combined in geographic groups with an average curve and a seasonal mean for the group, to which are added lines or symbols showing daily fluctuations from normal of wind, temperature and sunshine. Totals, summaries, means and averages are presented both in graphic and in tabular form.

While meteorology explains in a satisfactory manner the aerial distribution of pollen, it is necessary to look elsewhere for an adequate explanation of the presence, frequency and luxuriance of the weeds that obviously govern the amount of pollen to be liberated. Some of the more evident influences are latitude, soil, rainfall and agricultural conditions in the various localities. From a botanic standpoint this study may be regarded as an objective analysis of the life history of ragweed as it is affected in its genesis and development by soil and rainfall, in its maturation of pollen by temperature, in its blossoming by the direct influence of sunlight, and in its distribution of pollen by convection air currents and lateral winds.

Eastern Group (fig. 2).—Until last season, air research in our populous Eastern section has been confined to New York, Philadelphia and Richmond, Va.

TABLE 2.—*Ragweed Pollen Data, Season of 1929*

	Length of Active Season in Days	Average Daily Pollen Concentration*	Highest Concentration*	Total Pollen Count
Eastern				
Boston	26	22	82	582
New York	31	39	128	1,196
Philadelphia	40	45	186	1,799
Washington	46	43	235	1,956
Raleigh	35	16	69	557
Average	36	33	140	1,018
Southeastern				
Atlanta	43	33	173	1,437
Miami†	..	..	3	8
Great Lakes				
Sault Ste. Marie‡	26	20	92	500
Buffalo	35	120	565	4,902
Cleveland	35	92	460	3,214
Pittsburgh	35	71	402	2,468
Chicago	35	118	466	4,132
Average	35	100	473	3,512
Central				
Indianapolis	40	286	1,597	11,439
St. Louis	40	142	665	5,686
Memphis	50	92	645	4,580
Average	43	173	969	7,235
Plateau				
Boise	27	12	50	332
Miles City	15	16	58	248
Denver	25	71	205	1,767
El Paso‡	30	4	9	110
Average	22	33	104	782
Plains				
Moorhead	26	241	800	6,267
Omaha	50	242	1,241	12,085
Kansas City	50	256	823	12,806
Wichita	59	172	738	10,123
Oklahoma City	56	113	449	6,309
Average	48	205	810	9,518
Southern				
Dallas	54	86	605	4,634
New Orleans	30	36	95	1,090
Pacific				
Seattle†	..	..	..	....
Los Angeles	30	1	4	32
Grand average	37	92	417	3,830

* Number of pollens per cubic yard of air.
† Not included in grand average.
‡ Not included in group average.

From a comparison of the thirteen separate seasonal studies that have now been made in this district it is safe to assume that last year's results are reliable, and typical of the usual annual condition. Except in point of severity, the season here is very similar to that of the Great Lakes group. It is evident from the similarity of season and climate in these two sections that the

low atmospheric concentration of the Eastern seaboard is not due to factors operating during the actual pollinating season. The low altitude of all these stations except Raleigh suggests itself as a cause, since all other sea-level cities also show low pollen concentration, but the type of soil found throughout the region and the relatively small acreage of cultivated land may be the true explanation. Results at Raleigh strengthen the suspicion that soil unfavorable to ragweed may be

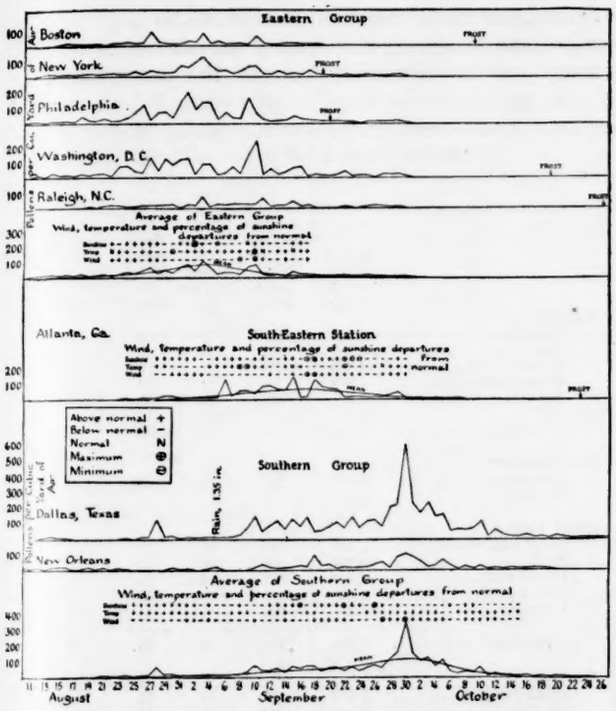


Fig. 2.—Ragweed pollen studies in 1929, Eastern, Southeastern and Southern groups.

the most important common eastern factor making for low pollen incidence. It is interesting to note on the average graph for the Eastern group the effect of various combinations of favorable or unfavorable weather conditions on pollen concentration on certain dates, particularly August 27 and 30 and September 5, 8 and 10. It should also be noted that the apex of the season occurred on a day of moderate wind velocity but of high temperature. It would seem that Boston has the shortest and lightest ragweed season of any large city east of the Rocky Mountains.

Southeastern Group (fig. 2).—Pollen observations at Miami are not representative even of Florida, as northern Florida has a fair amount of ragweed. So Atlanta is really the only active station representing the southeastern part of the United States. Its season is quite comparable in time, duration, apex and daily fluctuations with Memphis and Raleigh, and in severity with New York, Philadelphia and Washington. The Appalachian region and the Southeastern states require more study. Miami is blessed not only with sea breezes during August and September but with soil and climatic conditions almost wholly unfavorable to ragweed growth. Thus it proves to be the most accessible refuge yet studied for those persons in the "ragweed belt" who prefer flight to immunization.

Great Lakes Group (fig. 3).—Pittsburgh was included in the Great Lakes group on account of the remarkable similarity of its record to that of those cities actually on the lakes. Sault Sainte Marie almost qualifies as a hay-fever "resort," and as its record is so different from that of other cities in this group it is not used in the average. It had the coldest summer of any station included in the study. This may account for its small showing; but the small acreage of surrounding land under cultivation is more likely the true explanation. The most interesting feature of the average graph is the effect on the pollen curve of a combination of unfavorable wind, temperature and cloudiness, August 28 and 29, and the influence of cloudy skies and low winds from the 5th to the 8th of September. Frost occurred in four of the five stations on the 18th of September, but its part in terminating the season is very doubtful. Atmospheric records from Cleveland, Detroit, Toledo, Ann Arbor and Chicago for 1928 showed the termination of the season at exactly the same time as in 1929, while frost did not occur in 1928 until a week later. It is rather interesting to find that there are cities in this group with a north, a west and an east frontage on one of the great lakes. In neither case did this seem to minimize the effect of the strong pollen-carrying south winds. A station with a lake frontage on the south would furnish interesting comparisons. A private study made at Flint, Mich., last year by Dr. Barney Credille shows a heavier fall of pollen than any of the lake shore stations, as

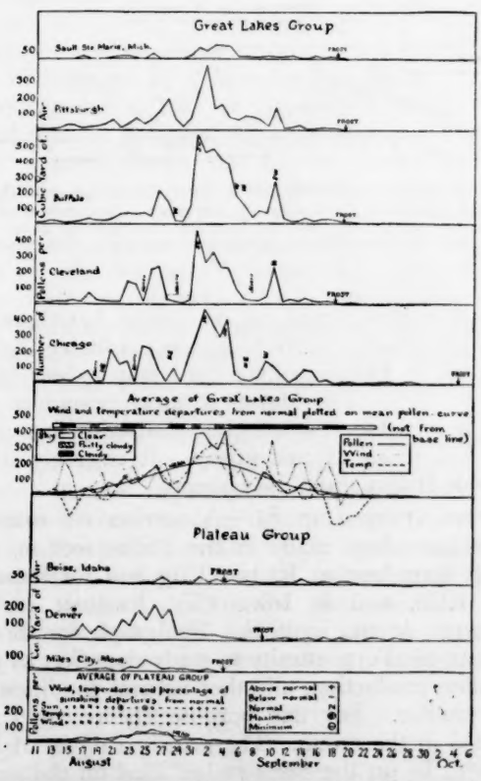


Fig. 3.—Ragweed pollen studies in 1929, Great Lakes and Plateau groups.

did the study at Ann Arbor made in 1928 by Dr. D. M. Cowie. The average pollen concentration over southern and central Michigan is no doubt as heavy as that of the "corn belt" states.

Central Group (fig. 4).—The records for St. Louis and Indianapolis are very similar except in volume and this may be easily accounted for by the difference in the size of the cities and the consequent difference in distance between the weather stations and the weedy areas.

Why the season should have terminated so early in St. Louis and why the record does not resemble that of Kansas City rather than Indianapolis is not clear. No satisfactory explanation has been thought of for the high record, August 27, at St. Louis and Indianapolis, but that it appears on both these records and on those of most of the stations in the Plains group is evidence that it was not an error of technic. It is doubtful whether

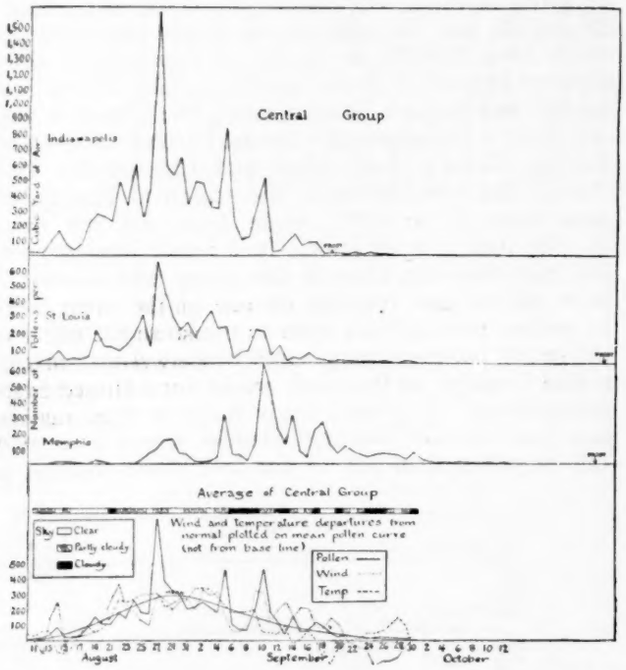


Fig. 4.—Ragweed pollen studies in 1929, Central group. The weather conditions plotted are the average for the group. Note that wind and temperature are not plotted from the base line, but that, as departures from normal, they are plotted from the mean pollen curve. Sky conditions as at 8 a. m.

this is a typical record for St. Louis, but there are no other quantitative pollen figures available for other years. The Indianapolis record was lighter than for 1926 or 1928. The Memphis curve resembles that of Atlanta in some respects, but the daily fluctuation is most like those of this group. It certainly does not resemble Dallas and New Orleans.

Plains Group (fig. 5).—A number of atmospheric studies have been made in the Plains section, records having been kept at Kansas City and Oklahoma City since 1926, and at Iowa City, Lincoln, Neb., and Rochester, Minn., in 1928. The graph for this group offers an ideal opportunity to study the effect of latitude on pollen production, all other natural conditions being quite similar. For this purpose Dallas could also be included in the group. The principal effect of latitude seems to be on the dates rather than on the length or severity of the pollen season, whose apex averages four weeks later in Texas than in Minnesota. The most noticeable feature of the individual graphs and one that is plainly shown in the average graph of the group is the low pollen counts during the second week of September. Here, as in the Great Lakes group, all weather conditions combined to hinder the ripening and distribution of pollen. It would be interesting to know whether cold weather or frost had anything to do with the abrupt termination of the season in Moorhead. Frost certainly played no part in any of the other stations of the group. The scant two inches of rain during June, July and August seems entirely inadequate to produce a crop of pollen such as Moorhead had, but Dallas did almost as well on half as much rain, less sunshine and much higher temperatures. Wichita (fig. 6) had the longest season of any city in the United States, while Kansas City carried off slight and questionable honors for total and daily average pollen concentration. Previous records for Oklahoma City have shown higher totals than were encountered at any other place in the United States, but these records were made at a ground level suburban station. No doubt, subnormal rainfall had some part in restricting the crop the past season.

TABLE 3.—*Meterological Factors Affecting Ragweed Pollen Production and Distribution During 1929*

	Wind*		Temperature Mean, Degrees F.*	Sunshine Mean, per Cent*	Rainfall	
	Total Movement, Miles	Average Daily Movement, Miles			During June, July and August, Inches	Departure from Normal
Eastern						
Boston	3,835	147	70	60	5.9	—
New York	8,735	281	73	68	4.7	—
Philadelphia	10,439	261	71	66	7.5	—
Washington	4,546	99	71	68	10.0	—
Raleigh	5,011	143	71	56	13.9	+
Average	6,513	186	71	64	8.4	—
Southeastern						
Atlanta	8,617	200	71	58	7.5	—
Miami†	.....	...	..	..	20.5	
Great Lakes						
Sault Ste. Marie	3,725	143	63	62	7.5	—
Buffalo	10,724	306	66	67	4.5	—
Cleveland	8,946	257	68	68	12.6	+
Pittsburgh	5,640	160	69	65	7.5	—
Chicago	7,367	210	68	70	10.6	+
Average	7,280	215	66	66	8.5	—
Central						
Indianapolis	7,099	177	70	75	13.3	+
St. Louis	8,765	218	69	65	9.7	—
Memphis	5,876	117	77	66	11.8	+
Average	7,247	171	72	69	11.6	+
Plateau						
Boise	2,688	99	70	86	1.2	—
Miles City	1,506	100	77	85	3.9	—
Denver	3,504	140	73	69	5.0	—
El Paso†	.....	...	76	..	4.7	—
Average	2,566	113	73	80	3.4	—
Plains						
Moorhead	4,276	164	70	82	2.0	—
Omaha	7,715	154	68	69	9.5	—
Kansas City	9,240	185	72	72	12.8	N
Wichita	13,960	236	74	64	15.5	+
Oklahoma City	9,756	174	75	71	5.9	—
Average	8,989	183	72	72	9.1	—
Southern						
Dallas	12,028	223	77	77	0.9§	—
New Orleans	4,277	142	76	71	21.5	+
Pacific						
Seattle†	.....	...	..	..	3.0	+
Los Angeles	.....	...	70	71	0.15	+
Grand average	7,011	181	71	69	8.5	—

* During active pollen season.
† Not included in grand average.
‡ Not included in grand or in local average.
§ Excessive rain in Dallas during May.

Plateau Group (fig. 3).—Subnormal summer rainfall in all cities of the Plateau group probably had some influence on the results found, but lack of any previous data from this section leaves us only a guess as to whether or not the figures in this study are typical. El Paso, like Miami, Los Angeles and Seattle, must be classified as "inactive" as far as ragweed pollen is concerned. Denver, with the most rainfall and the least sunshine of any of the group, made the only record

at all comparable with those of the Central and Eastern states. Note also that Denver's altitude of 5,200 feet is four times that of any other really active station. So ragweed is not fastidious about altitude. Certainly here is the definite, and decidedly elevated, western rim of the ragweed district. Only Kansas City has as large a variety of ragweeds as Denver. Miles City is distinguished by its very short season, which lasted only two weeks, and for the fact that the bulk of its ragweed pollen was from burweed marsh elder (*Iva xanthifolia*). This pollen, which was found in fair amounts on the slides from all the stations of this group, was also found in small amounts on the slides from Moorhead, Omaha, Chicago and Kansas City. Boise was short not only on ragweed pollen but on any other kind during August and September.

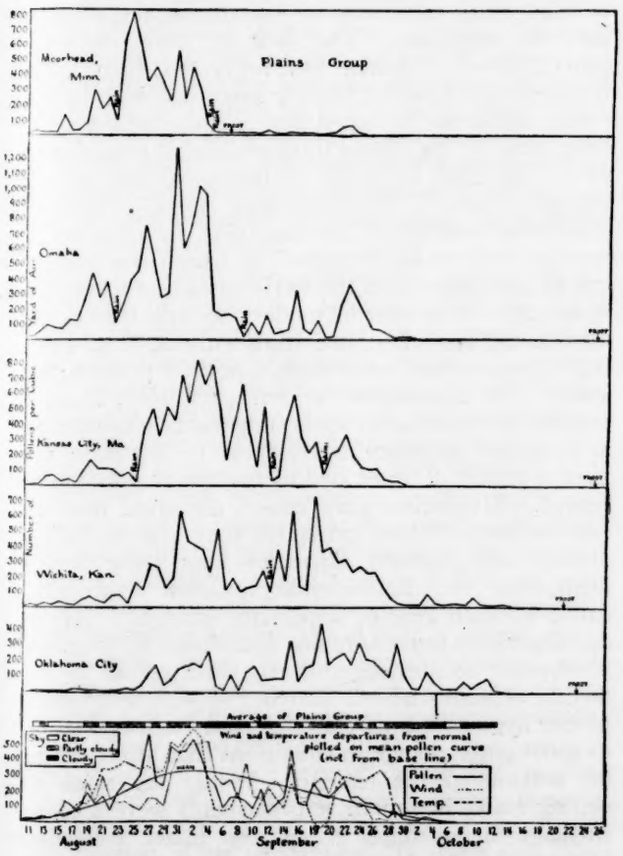


Fig. 5.—Ragweed pollen studies in 1929, Plains group.

Southern Group (fig. 2).—It is easily seen that the highest wind during the pollen season caused the climax of September 30 at both Dallas and New Orleans. Previous records from both these places have shown that the apex may occur any time during the last three weeks of September that a strong wind happens to blow. New Orleans had more than twenty times as much rain during June, July and August as did Dallas, and produced only about one-fourth as much pollen. In fact, the rainfall at New Orleans was the greatest of any station studied. By comparing its rainfall with that of Wichita, Kansas City, Omaha and Indianapolis, one might conclude that there was really too much rain in New Orleans for maximum pollen production. It is only fair to state that Dallas had excessive rain in May; but with the usual high summer temperatures of Texas it is difficult to understand how the plants could survive long enough to profit by the rain of September 5. This single rain must have made the crop of pollen at Dallas, which was heavier than that of Memphis. Such is the virility of the ragweed! Dr. I. S. Kahn exposed slides at San Antonio with results about equal to those of New Orleans.

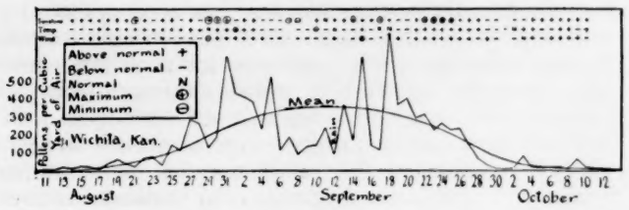


Fig. 6.—The effect of the three principal ripening and distributing factors is nicely shown in the Wichita record. Wind and temperature figures are the average for twenty-four hours. Since pollination takes place early in the morning, unusual weather conditions at that time are more effective than later in the day. This will account for occasional lack of coordination.

Pacific Group.—The two stations on the Pacific Coast serve merely as controls. Like El Paso and Miami, they have no ragweed "season" and no ragweed "problem." Seattle proves to be the only place in the United States so far investigated that is entirely free from ragweed pollen. A personal survey at Portland in July, 1929, failed to disclose even one specimen of any species of ragweed.

CONCLUSION

One of the outstanding aspects of this investigation is the establishment of a more or less definite boundary of the ragweed district of the United States. It may be said that the potential ragweed district is the portion of the United States east of the Rocky Mountains, except the south end of the Florida peninsula. In all parts of this area are found from one to seven species of ragweed. Thus the actual portion of the United States affected seriously by ragweed is slightly less than three fourths of the total area of the country, but this three fourths contains nine tenths of our population. Ideal soil and rainfall together with a maximum area of cultivated land make the Mississippi basin the world's greatest ragweed district.

The almost rigid dates of onset, climate and termination of the season are rapidly being established for all localities in the ragweed district, and their normal atmospheric concentration determined. Daily fluctuations of the pollen curve can be quite satisfactorily accounted for and predicted by and on much the same basis as weather. Thus the phenomena of pollen behavior are not local but are common over large districts. Temperature seems to rank next to wind

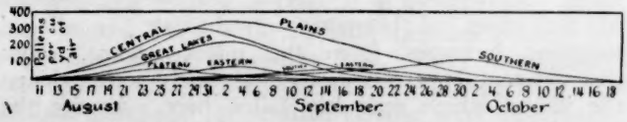


Fig. 7.—Simplified seasonal curves from figures 2, 3, 4 and 5, showing average dates of onset, apex and termination, as well as the comparative severity of the season in each section.

movement as an immediate determiner of the incidence of pollen.

Practical questions and answers concerning the control of this great menace, the removal of hay-fever sufferers from the potential ragweed area, and refinements in technic of diagnosis and prophylaxis, are bound up in quantitative air research.

THE PHYSIOLOGIC EFFECTS OF NON-LIVING TESTIS GRAFTS*

CARL R. MOORE, PH.D.
CHICAGO

Transplantation into man of whole, or parts of, testicles as a therapeutic measure has been practiced to some extent by surgeons and urologists in both this and foreign countries. The premises for such procedures have been the loss of both testicles through injury or removal, or, more often, an assumed "hypogonadism" in a patient whose own organs were diagnosed as below normal function in the production of their internal secretions. The latter diagnosis is of particular interest because of the fact that up to the present time there have been no recognized means of detecting a low male hormone state in man; ephemeral indexes have been assumed to be indicative of this condition just as equally elusive and questionable psychic reactions have been assumed to indicate increases in hormone titer after certain manipulations.

A review of the literature on testis transplantation into man during the last twenty years acquaints one with the fact that, in addition to the transfer of human testis tissues from man to man, the transfer of testis material from the dog, goat, ram, bull, boar, deer, monkey and ape to man has likewise been practiced.[1] Some writers imply or definitely state that such testis grafts become incorporated within the body as "takes," thereby intimating that the graft becomes a functional unit of the body and continues to furnish testis hormone. The general laws of tissue specificity make it highly probable that tissue from another than the host species will be proved not susceptible of incorporation; such claims have been advanced, however, in the case of transfer of tissue of closely related species, such as monkeys or higher apes, to man.[2] It becomes obvious that in the absence of functional incorporation of living tissue the effects from such transplantations, if any, fall necessarily on the transferred nonviable tissue which undergoes autolysis and resorption, perhaps accompanied by inflammation, suppuration and sloughing. Can such a series of events be physiologically beneficial to a human patient? Some surgeons have answered in the affirmative by repeatedly carrying out such practices, disclaiming that psychology is the basis of noted improvements.

The absence of dependable indexes for the alleged "hypogonadism" in man, or the inability to utilize proved indicators for hormone introduction by any means, appears to have caused but little concern to clinicians employing these supposedly remedial measures. Astonishing as it may be, published statements of the effect of hormone introduction, or alleged hormone increases from the intact organs, claim improvements for conditions that fairly well exhaust the ills to which man has fallen heir. Among the imposing array of benefits presumably derived from an increased hormone introduction may be mentioned an increased sex life, better appetite, a feeling of well being, gain in weight, loss in weight, disuse of crutch and cane in decrepit conditions, gray hair turned brown, return of natural vigor, better sleep, increased libido, more regularity in bowel movements, more acute special senses, improvements in memory and mental concentration, rise in blood pressure, improvements in general asthenia, rheumatism, acne vulgaris, neurasthenia, poor vision, asthma, tuberculosis, senility, sex lassitude, impotence, epilepsy, dementia praecox, paranoia, diabetes and locomotor ataxia. Lest this complex list be insufficient to justify the practice of sex gland manipulations, the hypothesis has been advanced that (after vasectomy) first the thyroid gland is stimulated and after that it influences "those glands that are most prominent or delinquent in the patient's constitution."[3]

The time is long overdue when serious inquiry should be directed to the effects of introducing testis hormone into the organism. The lack of testis extracts of proved potency, which has prevented such a study heretofore, is now fortunately succeeded both by active preparations and by dependable methods of detecting at least some of the effects in experimental animals; these effects are read in terms of functional and structural changes instead of in psychologic states. Dependable, short-time indicators for hormone introduction into man are still to be developed, and until some criterion can be used other than the vicissitudes of a mental state, so largely conditioned by modern society, the results of introducing testis hormone from without, or of increasing it from within, must remain in their present chaotic state. The contentions of some (Stanley, Hunt and others) that nonviable testis transplants into man exert a beneficial influence attributable to hormone action over a period of from one to two years must be challenged. Headaches may cease; digestion may show improvements; blood pressures may rise or fall, and mental and physical capacities may show improvement, but the fundamental question concerns the cause of such real or imaginary changes. Are they attributable to testis hormone introduced through transplantation; to the suggestions, anticipations or other mental attitudes of the patient; to a forced rest and proper hygiene during convalescence from operation, or to some other change in conditions that affect the mental horizon of the patient? Would the same stage setting result in similar improvements were a piece of cartilage or perhaps a salivary gland transplanted instead of testis tissue? I am not here interested in psychic phenomena and their cause but wish to attempt only an inquiry into the physiologic effects of the transplanted testis tissue. Does such a mass of testis tissue transplanted into man produce, or liberate, testis hormone that can be proved to have a beneficial or a demonstrable effect?

The approach to an analysis of the effect of nonviable testis transplantations has been made through the utilization of experimental animals in which definite objective, structural and functional indexes for hormone effects are known. The danger of applying facts determined for one species of an animal to another is recognized, but the general principles of fundamental physiology still exist.

EXPERIMENTAL INVESTIGATION

The development in this laboratory of dependable methods for detecting the testis hormone, whether sup-

* From the Hull Zoological Laboratories, University of Chicago.
* This investigation has been aided by a grant from the Committee on Research in Problems of Sex of the National Research Council, administered by Prof. F. R. Lillie.

1. Hunt, H. L.: Endocrinology **6**: 652 (Sept.) 1922; **9**: 479 (Nov.-Dec.) 1925; **12**: 491 (July-Aug.) 1928. Stanley, L. L.: California State J. Med. **18**: 251 (July) 1920; Endocrinology **5**: 708 (Nov.) 1921; **6**: 787 (Nov.) 1922. Stanley, L. L., and Kelker, G. D.: Testicle Transplantation, J. A. M. A. **74**: 1501 (May 29) 1920. Walker, K. M.: Lancet **1**: 319 (Feb. 16) 1924.

2. Voronoff, Serge; and Alexandrescu, George: La greffe testiculaire du singe à l'homme, Paris, Gaston Doin, 1929. Thorek, Max: Endocrinology **6**: 771 (Nov.) 1922.

3. Benjamin, H.: Endocrinology **6**: 776 (Nov.) 1922.

plied by normal or operatively modified testes or introduced by the injection of potent testis extracts, has shown that the hormone is not stored within the body but, like the female hormone, is excreted. The urine of men is now proving a valuable source for the substance. The reader is referred to earlier papers from this laboratory for the details of detection methods and their application.[4] It may be stated here that in utilizing the guinea-pig the differential viability of spermatozoa in the isolated epididymis has given a means by which hormone production can be detected for as short a period as ten days. Similarly in guinea-pigs the electrical ejaculation test has made it possible to determine the positive physiologic effect of injecting testis extracts for as short a time as seven days. In the rat the prostate cytology test when properly employed will enable one to determine an effect from testis hormone injection of only four or five days. Finally, the study of the cytology of the rat seminal vesicle serves as a reliable indicator for the hormone introduced by injection for periods as short as two or three days.[5] With these facts before us, it would appear certain that any hormone produced by a transplanted testis would be susceptible of detection unless the amount produced was well below that produced by intact testes for a period of from three to ten days.

Autoplastic Testis Transplants in Guinea-Pigs.—Guinea-pigs in vigorous healthy condition were employed to determine whether testis tissue transplanted subcutaneously in amounts too large to become actively incorporated in the organism would liberate detectable amounts of the hormone, the spermatozoon motility test being used as the hormone indicator. The removal under aseptic conditions of both testes of adult animals from their corresponding epididymides was performed in such a manner that the epididymides could be returned uninjured to the scrotum with their content of living spermatozoa. Each testis was then cut open and placed in an especially prepared incorporation bed made by tunneling beneath the skin in a lateral direction each way from the midventral incision; each incorporation bed was scarified to promote excess vascularity in order to favor resorption from the tissue. The two testes were so distributed in these pockets that no apparent nodule existed after the median incision was closed. A day or two, however, brought forth apparent swelling and indications of an inflammatory reaction at the graft site. In some cases the formerly unbroken skin covering the transplanted tissue was ultimately perforated and a slight discharge became visible. In all cases the transplanted tissue was absorbed or dissolved and discharged. Proper examination of the viability of spermatozoa within the isolated epididymis at the usual test period failed to show a detectable amount of hormone, despite the fact that a ten day production by the normal testis could be detected by this means. The details of these experiments have been reported elsewhere,[6] and it was concluded that if any hormone had been liberated from the two testes transplanted into subcutaneous pockets in the guinea-pig it was an amount less than that produced by the intact testicles within a ten day period, and therefore not susceptible of detection by any known means.

Autoplastic Testis Transplantation in the Rat.—Smaller amounts of the hormone, or its presence for shorter periods of time, can be detected in the rat by the prostate cytology and seminal vesicle cytology tests than can be detected in the guinea-pig by the spermatozoon motility test. Accordingly, operations were performed on the rat similar to those on the guinea-pig. The two testes were removed from their normal location and slit lengthwise, and each was placed in a subcutaneous incorporation bed lateral to the midventral incision.

Reference to the cytologic details in papers[7] that we have recently published will fully acquaint one with the fact that castration changes are easily detectable in the prostate gland within five days after removal of the testis, and in the seminal vesicles within three days after operation. These castration changes can be prevented from developing after removal of the testis by hypodermic injections of potent testis extracts for indefinite periods, as long as the injections are continued once or twice daily. It follows, therefore, that if the two transplanted testes liberate the hormone in appreciable amounts, the castration signs that invariably follow when the hormone source is removed by castration would be delayed in their time of appearance or entirely prevented from appearing as long as the hormone was being liberated.

Experiment 1: During June, 1929, adult rats were operated on, one testis being placed subcutaneously, as already described, whereas the second testis was sewed to the peritoneum. They were killed nine days later and cytologic preparations of the prostate gland and seminal vesicles were studied. Preparations from all animals showed definite and unmistakable castration changes in both these accessory reproductive glands. The epithelium of the seminal vesicles did not contain secretion granules and the prostate did not show the diagnostic light areas of secreting cells. Epithelial cell regression was apparent in both glands.

The results of this procedure fail entirely to give evidence of hormone liberation from the transplanted tissues. The castration picture is that of animals without testes for similar periods of time. Since these castration changes are definite in ordinary castration within five days after operation, I conclude that the hormone, if liberated from the transplants at all, was present in too small an amount to delay for four days the appearance of castration changes.

Experiment 2: During July, 1929, adult rats were castrated and their two testicles were slit open, each being placed in a separate subcutaneous pocket on either side of the midventral line. They were killed four days later and cytologic preparations of both the prostate gland and the seminal vesicles were examined.

Had these animals been ordinary castrates, one would have expected to find in the secretory cells of the middle and posterior lobes of the prostate the diagnostic clear region occupying the area of the Golgi apparatus, since this is usually present up to the fourth or fifth day. Secretion granules in the secretory cells of the seminal vesicles would not be expected, since these have always been absent on the third day of castration in preparations of Bouin fixation and hema-

4. Moore, C. R.: J. Exper. Zool. **50**: 455 (April 5) 1928; Biol. Bull. **55**: 339 (Nov.) 1928. Moore, C. R., and Gallagher, T. F.: Am. J. Physiol. **89**: 388 (July) 1929; Am. J. Anat. **45**: 39 (Jan.) 1930. Moore, C. R.; Gallagher, T. F., and Koch, F. C.: Endocrinology **13**: 367 (July-Aug.) 1929. Moore, C. R.; Hughes, Winifred; and Gallagher, T. F.: Am. J. Anat. **45**: 109 (Jan.) 1930. Moore, C. R.; Price, Dorothy; and Gallagher, T. F.: Ibid. **45**: 71 (Jan.) 1930.

5. Moore, Hughes and Gallagher (footnote 4). Moore, Price and Gallagher (footnote 4).

6. Moore, C. R.: Biol. Bull. **55**: 339 (Nov.) 1928.

7. Moore and Gallagher (footnote 4). Moore, Hughes and Gallagher (footnote 4). Moore, Price and Gallagher (footnote 4).

toxylin stain. If the two transplanted testes had liberated detectable amounts of the hormone, on the other hand, the diagnostic areas of prostate secretory epithelium should have been strong and secretion granules should have been present in the seminal vesicle epithelium.

The preparations showed conditions typical for the four day castration period. The diagnostic light areas of the prostate were only faintly visible. The seminal vesicle epithelium did not contain secretion granules. Had the hormone been liberated in an amount equivalent to one day's output for the normal intact testes, it would have been detected by these methods.

Experiment 3: During November, 1929, a group of adult rats was castrated and the two testes were similarly placed in especially prepared subcutaneous incorporation beds, the testicular substance being spread out as an aid to rapid absorption or autolysis. The animals were killed five days after operation and the prostate gland and seminal vesicles studied to determine whether perceptible amounts of the hormone had been liberated from the transplanted tissue. It will be obvious from the foregoing discussion that a hormone supply equivalent to one day's production could be detected by the appearance of the diagnostic light areas of the prostate, since ordinary castration of four days usually shows these areas faintly. Had the hormone been produced in larger amounts, the secretory cells of the seminal vesicles would have contained secretion granules.

Examination of the tissues showed them to be of ordinary castrate type. The diagnostic light areas of the prostate were not present and the epithelial cell regression was beginning to appear. The seminal vesicles were likewise unaffected and entirely similar to those of ordinary five day castration. If any hormone at all was liberated from these two testes, it was an amount that was not detectable, and this amount would be less than the amount sufficient to delay the onset of castration effects for one day.

More than twenty animals have been examined for evidences of an effect from the autotransplantation of two testes, without any indication being found that the hormone was liberated during autolysis of the tissue.

COMMENT

The results of the experiments presented here deserve a few comments.

Hitherto the effects of castration in mammals have been made apparent only after some months or years because of the lack of known methods for detecting them earlier. Recently developed indicators for the hormone (or lack of it) have now made it possible to learn something of its behavior. By the purely physiologic spermatozoon motility test, depending on the viability of spermatozoa in the isolated epididymis of guinea-pigs, it has been possible to note castration effects within ten days after removal of the testis, and with other criteria (electrical ejaculation test [8]) definite indications appear within seven days. These castration effects are proved by experimental cryptorchidism to be conditioned by the absence of the internal secretion of the testis and not by the absence of spermatogenesis. Furthermore, we [4] have been able to prevent the appearance of castration effects by injecting potent extracts of testicles after the animal's own testes have been removed.

8. Moore and Gallagher (footnote 4).

In the male rat our methods have permitted us to detect castration effects as early as from three to five days after operation and the changes noted have been atrophic ones; definite structural changes have made their appearance by this time and continue to be more pronounced as time goes on. Their appearance can be delayed indefinitely after castration or, if permitted to develop, can be promptly restored to normal by subcutaneous injections of testis hormone. If these injections are discontinued at any time, castration changes appear as rapidly as after removal of the testis without injections.

These facts clearly prove that the body does not retain the hormone produced by the intact testes for any appreciable period of time. If any further proofs were necessary to establish this idea, they are certainly to be found in the fact that the urine of males is now a recognized source from which to obtain the hormone.[9] Continuous slow production in the gonads thus provides the body with the testis hormone, probably in a saturated condition, and its elimination through the kidneys is at least the fate of the excess. Nothing is known at the present time regarding the body concentration of the hormone or the factors that may be operative in its retention or elimination, but it is reasonable to believe that its continuous excretion is carried on by the kidneys. It is at least known that its absence can be detected within from three to five days by morphologic changes in the accessory glands of reproduction.

Thus the basis for proper consideration of testis transplantation is at hand. It should be made clear that I am not here concerned with viable testis grafts. When a testis transplant is made from the same or similar animal and the graft of sufficient mass becomes thoroughly incorporated within the body and secretes, it can supplant the normal testicle as long as it produces the hormone in sufficient quantities. I am unable to share the optimism of others, however, as to the ease with which viable grafts are obtained. Too great emphasis cannot be placed on the fact that a palpable nodule at the site of transplantation in no sense presages a functional graft. My own experiences [10] with transplantation of testes from immature or young rats directly to somewhat older ones gave less than 60 per cent graft recovery within six months after operation. Perhaps less than half of the recovered grafts could in any sense be considered functional. The nonviable graft, such as the tissue derived from another animal species or tissue from a similar animal that, failing to resist the forces antagonistic to its incorporation, undergoes autolysis, raises but one pertinent question. Does it release into the host organism a sufficient amount of the hormone to be detectable by any known means? If it does not, then speculations regarding the potency of such supposed therapy become worthless.

The results of the experiments detailed here may be clearly stated by saying that autotransplantation of two testes in rats and guinea-pigs has failed to modify the castration picture. If the autolytic processes going on in the transplanted testes had served to liberate appreciable amounts of hormone, the condition of the prostate gland and seminal vesicle secretory epithelium in the rat would have shown less marked atrophic changes on the fourth to the ninth day in such animals

9. Funk, Casimir; and Harrow, Benjamin: Proc. Soc. Exper. Biol. & Med. **26**: 325 (Jan.) 1929.
10. Moore, C. R.: Am. J. Anat. **37**: 351 (May) 1926.

than in those merely castrated. The fact that the condition was not different from that in simple castrates after a period of like duration, the transplantation having failed completely to delay the onset of these rapidly developing atrophic changes, is the basis of my conclusion that the hormone is not liberated in autolyzing grafts in sufficient amounts to be detectable by any means at present known. The amount of hormone liberated, if at all, would therefore be too small to delay the retrogressive changes of the indicators by from one to two days.

What, therefore, in the light of these results, can be said of the therapeutic value of transplantation into man of foreign testicular tissue or human testis that fails to become intimately incorporated into the body as one of its functional units?

Since at the present time dependable criteria do not exist of the effect of hormone diminution or loss in man short of months or years, it is utter folly to speak of immediate effects. The clinician may still write glibly of an "improved sense of well being," "better sleep," "better appetite," "increased mental vigor," and the host of similar intangible elements of a complex life and yet fail entirely to present any acceptable evidence either that these "improvements" are a result of hormone action or, indeed, that any hormone whatever has thus been administered.

In regard to prolonged effects, the situation is even worse in the light of the results in experimental animals. A mass of transplanted, autolyzing, testis tissue has in my experience usually completely disintegrated within thirty days; walled off pus pockets may remain at the site of transplantation. Furthermore, in the process of autolysis I have been unable to detect the liberation of any hormone, even an amount that would delay the onset of castration effects for a period of two days. Not only is there lack of evidence that any hormone has been liberated but of still greater importance is the fact that had any been released it would promptly have been excreted by the kidneys. It matters not whether the hormone is supplied by the intact testicle or by injections of potent extracts: castration changes develop at once when the source is removed. Within ten days after the cessation of injections, or after castration, the seminal vesicle secretory epithelium is almost as degenerate as it would be after several months without the hormone.

It would appear, therefore, that the clinician who describes the beneficial effects, supposedly lasting from one to two years, from sheep, dog, bull, deer or other such testis transplants into man, is concerned with psychic phenomena rather than hormone action. Recourse to the contention that such beneficial effects are mediated through a stimulating action on the patients' own gonads by the graft will also not help him out, because the evidence for this contention is as groundless as the idea of direct hormone effect on the organism. Two established points would be necessary before such an ideal could be countenanced: (1) that the autolyzing graft really introduced hormone for such a stimulation or (2) that hormone actually introduced by whatever means exerts a stimulating action on the gonad tissue, resulting in increased hormone production on their part. The chief merit of the experiments cited here, perhaps, is to show that hormone is not liberated from such nonviable grafts in amounts that can be detected by any known method. Not only is there a total lack of support for the second idea but it is at the same time illogical. To my knowledge no organ within the body is stimulated to increased function by the introduction of products which it itself produces. The islet tissue of the pancreas is not stimulated by the injection of insulin, the thyroid by thyroxin, the ovary by the female sex hormone, the suprarenal by epinephrine or cortical preparations, or the hypophysis by solution of pituitary or extracts of the anterior lobe. Why, in the face of all such negative evidence regarding other glands as well as the testis itself, should any one postulate that testis hormone would revivify a so-called hypofunctional testis? Hormone actions in general are concerned not with the functional activity of the organ producing them but with other structures or conditions, such as the burning of sugar, blood pressure changes, or maintenance of the normal condition of the secondary sex characteristics.

When we thus stop to weigh the evidence that has been offered for the stimulating action of nonviable testicle grafts, it appears that we shall have to invoke psychic states as material even for discussion, and such provinces are beyond the one here considered.

SUMMARY AND CONCLUSIONS

1. The spermatozoon motility test provides a means of revealing the presence of testis hormone in guinea-pigs for periods as short as ten days; yet by means of this test it has been impossible to detect any hormone liberated from two autoplastic, whole testis grafts placed in subcutaneous pockets.

2. In the rat a cytologic study of the prostate gland and seminal vesicles affords dependable methods of detecting the absence of hormone for periods of from three to five days. Here, also, two autoplastic, whole testis grafts in subcutaneous pockets fail to delay the onset of castration changes for as short a period as two days.

3. The autolysis of nonviable testicular grafts does not liberate hormone in amounts that can be detected by any means at present known. Furthermore, the testis hormone is not stored within the body but is excreted by the kidneys. A continuous supply is necessary to maintain the secondary sex characters in a normal condition.

4. There is no known acceptable evidence that nonviable testis grafts, i. e., grafts that fail to become incorporated within the body and actively secrete, exert any immediate or remote beneficial effect on the host organism.

Mental Disease in England.—The Report of the Mental Deficiency Committee (1929) estimates the total number of mental defectives in England and Wales certifiable under the Mental Deficiency Act of 1913 at more than 300,000. A report of the Board of Control for England and Wales stated that at the end of 1927 there were 138,293 certified insane patients. These figures do not include insane persons maintained in poor-law institutions. The average annual increase of the certified insane for the three years 1920-1922 was 3,482, compared with an average prewar increase of 2,095 for the ten years ended Dec. 31, 1913. In Scotland, Jan. 1, 1924, the number of insane and mentally defective was 21,098. In comparison with these figures let us consider a recent observation made in the United States. The last federal census of patients with mental disease in institutions was taken as at Jan. 1, 1923. The number of resident patients in mental hospitals on that date reached the tremendous total of 267,617, or 241.8 per hundred thousand of population; the number was practically three times as great in 1923 as in 1880.—Henderson, D. K., and Gillespie, R. D.: A Text-Book of Psychiatry for Students and Practitioners, Oxford University Press, 1930.

Clinical Notes, Suggestions and New Instruments

MORPHINE IN MYXEDEMA*

EDWARD B. BENEDICT, M.D., BOSTON

In a previous communication, Lund and I[1] reported a series of experiments in which it was shown that the depressing effect of morphine on the rate of metabolism was greater in rabbits after they had been thyroidectomized than before, and that morphine had almost no effect in the same rabbits when they had been rendered thyrotoxic by thyroid feeding. In other words, it appeared that the action of morphine is intensified by the hypothyroid state and diminished by the hyperthyroid state. These studies were undertaken because of an experience with a patient of Dr. F. B. Lund's, who, after receiving a routine dose of one-sixth grain (11 mg.) of morphine in preparation for laparotomy, went into coma and had a marked slowing of respiration which lasted for more than eight hours. The patient further gave a history of similar episodes on two prior occasions. On search for a cause for her increased sensitivity to morphine, it was found that although not frankly myxedematous she had a lowered basal metabolic rate. It was to throw further light on the possible relation of hyperthyroidism and hypothyroidism to morphine susceptibility that the rabbit experiments were carried out.

There has recently been a patient with myxedema in the medical wards of the Massachusetts General Hospital in whom the effect of morphine was so amazingly parallel to that in experiments on rabbits as to be worthy of record.[2]

REORT OF CASES

CASE 1.—Miss G., a woman, aged 73, entered the hospital, Nov. 23, 1929, with a well marked myxedema, complicated by a typical picture of pernicious anemia.[3] The symptoms, which had occurred over a two year period, were those of asthenia, anemia, increased sensitivity to cold, sore tongue, dry skin, tingling in the fingers and some swelling of the face. Examination showed an expressionless, puffy face, dry and yellow skin, a large thick tongue, slow, thick speech, a hoarse voice and evident mental retardation. There was achylia gastrica and a blood picture typical of pernicious anemia, with a red count of 1.2 million and a hemoglobin of 35. The basal metabolism was —26, November 25, and —20, November 27.

The patient was put on liver extract, and November 29, when she was just beginning to show a characteristic reticulocyte response, and before she had received thyroid, she was sent to the operating room for the removal under local anesthesia of a large ulcerated, perineal fibroma, in preparation for which she was given one-fourth grain (16 mg.) of morphine.

The operation went smoothly, but directly after the patient's return to the ward her respiration dropped from 20 to 7 and remained below 15 for twenty-four hours. She went into a state of lethargy from which she could hardly be roused, and there was a striking intensification of the myxedematous appearance. Large amounts of fluid collected in the eyelids, which had the appearance of being simply bags of water. There developed, too, a chemosis of the conjunctivae. It was noted with surprise, however, that the pupils were not strikingly contracted. She was placed on the danger list and given 25 grains (1.6 Gm.) of caffeine and 1 mg. of thyroxin intravenously.

The next day she was much brighter and from then on continued to improve. The fluid from the eyelids and conjunctivae rapidly disappeared. She was kept on liver extract and thyroid by mouth, and by December 14 the red cell count had increased by one and a half million, the signs of myxedema had disappeared, and the basal metabolism had risen to +5.

December 20, the patient was given one-eighth grain (8 mg.) of morphine because of restlessness at night, and one-sixth grain (11 mg.), December 22. Thyroid medication had been omitted for a few days at this time because the metabolism had been raised to a supernormal level by excessive dosage. The metabolism, December 14, had reached +37; December 18, it was +17, and December 23, +2. On neither of these occasions while the patient had a plus rate was there the slightest evidence of an undue morphine effect.

Because the results in this case were so strikingly consistent with those of the experimental work, it was decided to look through the hospital records for episodes of a similar sort. A series of 102 cases of myxedema and 128 cases of hypometabolism without definite myxedema were reviewed. Only fifteen of these patients received morphine at a time when the metabolism was lower than —10, and of these there were two who showed what might be taken to be evidence of undue sensitivity to that drug.

CASE 2.—Mrs. E., aged 34, presented a definite picture of myxedema, with a metabolism of —20, an associated weakness and anemia, and a bronchiectasis. Because of restlessness, she was given one-eighth grain (8 mg.) of morphine, shortly after which she lapsed into unconsciousness and died. Although this patient was very ill before morphine was given she was by no means moribund, and it was felt quite definitely that morphine had hastened her death.

CASE 3.—Miss B. entered with a diagnosis of menorrhagia. Her metabolism was —19, but she was not myxedematous. After one preoperative dose of one-sixth grain (11 mg.) of morphine, preparatory to curettage, and two similar postoperative doses, given over a space of eleven hours, her respirations fell from 20 to 10, and remained low for several hours. Such a drop in the respirations, after only three widely spaced doses of morphine, is sufficiently unusual to suggest a relationship between morphine and hypothyroidism.

SUMMARY

The three cases here reported show that morphine may be dangerous in myxedema and hypothyroidism.

These cases give clinical support to experimental work previously published, in which it was shown that in hypothyroidism the action of morphine is intensified.

* From the Medical and Surgical Services of the Massachusetts General Hospital.

1. Lund, C. C., and Benedict, E. B.: The Influence of the Thyroid Gland on the Action of Morphine, New England J. Med. **201**: 345-353 (Aug. 22) 1929.

2. The writer, a member of the surgical staff, is indebted to the physician in charge for permission to report this case.

3. The history in this case will be published in full elsewhere by Means and Lerman in connection with a discussion of the association of myxedema and pernicious anemia.

EPIDEMIC OF DERMATITIS VENENATA DUE TO A HITHERTO UNDESCRIBED CAUSE

FREDERICK R. TAYLOR, M.D., HIGH POINT, N. C.

Early in the rabbit hunting season, Dr. W. L. Jackson of High Point asked me to look at the hands of a man who had just consulted him. They showed what appeared to be a typical violent dermatitis venenata—a hyperacute vesicular eruption completely involving the hands and wrists, but limited to those areas. There was marked swelling of the hands. The patient remarked that the eruption had appeared the day following a successful rabbit hunt, and after skinning and cleaning the game. He added that a friend who was hunting with him had had a similar eruption on his hands after dressing his rabbits. No isolated papules, ulcers, conjunctivitis, enlarged glands, fever or other constitutional symptoms were present—in short, there was nothing whatever suggestive of tularemia. The condition seemed to me to be an ordinary dermatitis venenata, and while its occurrence in association with the dressing of rabbits was interesting, it seemed reasonable to assume that any one out hunting might encounter poison sumach or some other irritant plant that might be the cause.

Early in January Miss V. Y., aged 18, my office girl, appeared one morning with a similar violent eruption completely involving both hands and part of the wrists, but limited to those areas, and with no symptoms or physical signs suggestive of tularemia. There was a confluent vesicular eruption with blebs

here and there, and marked swelling of the hands. The rabbit episode had passed out of my mind and, after careful inquiry as to possible causes, I made a tentative diagnosis of dermatitis venenata due to dressing a cedar Christmas tree, simply because I did not know of any other possible cause, and it seemed as though all other causes ordinarily to be thought of had been excluded, at least to a fairly high degree of probability. She was given nothing but local treatment and in a week the eruption had disappeared, followed by peeling of the involved areas. After about three weeks had elapsed, she asked me whether I thought it possible that cleaning a rabbit could have caused the eruption on her hands, adding that an acquaintance had suggested the idea to her because he and a friend of his had had similar trouble after dressing rabbits. (They were not the same persons as those mentioned at the beginning of this report.) Further inquiry elicited the information that her brother had shot and skinned a rabbit. The next day a few insignificant lesions developed on the webs of the fingers that did not require treatment. The patient did not come into any contact with the fur, so far as she knows, but merely cleaned the rabbit after her brother had skinned it, and the next day the violent eruption had appeared. This would seem to lessen the likelihood of the cause being a contamination of the rabbit's fur with poison sumach or other such material, and indicate the possibility of the trouble being associated with something in the actual tissues of the rabbit. Although the patient appeared in perfect health and the eruption had entirely disappeared by this time, a blood specimen was sent to Dr. C. A. Shore, director of the state laboratory, with a letter describing the case, and a request was made for a tularemia agglutination test. Dr. Shore forwarded the blood to the U. S. Hygienic Laboratory, which reported it negative for tularemia. He also wrote in reply to my letter that he had heard of a number of similar cases, especially in the territory around Aberdeen, N. C.; that he had seen one case, his diagnosis being dermatitis venenata, and that in all these cases the patients had stated that the condition seemed to be associated with dressing rabbits. At the February meeting of the Guilford County Medical Society, I happened to remark about these cases to Dr. Norman Fox of Stokesdale, and he said that he could add another similar case to this series, in which the patient put the blame for the trouble on dressing rabbits.

I am not familiar with any description of such a cause of dermatitis venenata in the literature, nor have I ever seen cases of this sort, in which the victims attributed the trouble to rabbits, before the present hunting season. If such a condition has been recognized in the past, or if others have had additional experience this season to add to this report, I should be glad to hear of it. If there is a toxic substance in the tissues of the rabbits, I do not know what it is or how it gets there. It would seem probable that if there is such a poison either cooking or digestion will destroy it, as I know of no bad effects having followed the eating of these rabbits.

In my patient a careful general examination was made three weeks after the eruption had cleared up, and nothing further was found. The urine, stool and blood film, including a differential white cell count, were normal, and the Wassermann reaction was negative.

These experiences were the basis of an informal talk given before the Tri-State Medical Society of Virginia and the Carolinas at Charleston, Feb. 18, 1930. The discussion that followed the talk was most interesting and illuminating.

Dr. Wingate Johnson of Winston-Salem, N. C., stated that six or seven years ago he had two patients in the same season who gave the following histories: One, a man, killed a rabbit and stuffed it in his hip pocket. The blood soaked through to the buttock and the back of the thigh and he had an eruption like that described here where the blood had come in contact with the skin. The other patient was a boy who killed a rabbit and carried it home, swinging it alongside his thigh and leg; the blood ran through the trouser leg and produced a similar acute vesicular eruption wherever it touched the skin.

Dr. W. R. Wallace of Chester, S. C., told of a woman, aged 73, who this season had dressed a rabbit and had had an eruption occur on her hands similar to that described. In all these cases the eruption appeared the day after exposure to the rabbit.

Dr. W. F. Elliott of Lincolnton, N. C., said he could add a similar case involving the hands. I have also just learned of two more cases occurring in High Point in the practice of Dr. I. T. Mann. One of the men had been hunting; the other had gone out and got a trapped rabbit. Both had dressed the rabbits.

Dr. Johnson of Winston-Salem told me he had never seen a case before or since the two cases he saw several years ago; he had talked the matter over with a number of Winston-Salem physicians and had not found any one else who had seen the condition at that time. He made reports of the cases to the Forsyth County Medical Society but did not publish them. I am glad, however, to give him priority for reporting these cases when he did.

I do not pretend to have solved the etiology of this condition in any final way, but it seems proper to present the subject at this time in the hope that further reports and investigation, both clinical and pathologic, and especially chemical, may develop a fuller knowledge of this subject. A unique aspect of the situation is that, in every case that I have heard of so far, the patient himself has volunteered the suspicion that handling rabbits was the cause of the disease, and all but one, my office girl, volunteered that information spontaneously; she asked the question because of the suggestion of another person with the eruption. I do not know of a case in which the physician's attention has been drawn to rabbits as a possible cause by any circumstance other than the suggestion of the patient.

THE OCCURRENCE OF DIABETES DURING PREGNANCY IN A WOMAN BEARING LARGE BABIES

HAROLD BOWCOCK, M.D., AND JAMES R. McCORD, M.D.,
ATLANTA, GA.

The interesting observation that the babies of diabetic mothers are often oversize has been recorded occasionally in medical literature. Of six babies born of diabetic mothers, at term, Bowen[1] reports that their weights were 6, 7 and 10 pounds; 9 pounds 2 ounces; 10 pounds 6 ounces, and 10 pounds 10 ounces. Springer[2] quotes the finding of Colorni that 19.5 per cent of the fetuses of diabetic mothers are oversize. Joslin[3] records the opinion of Blanco that a fat baby born dead suggests the examination of the parents for diabetes, and states that these observations correspond to the overgrowth that he has noted in children previous to the onset of diabetes.[4]

The appearance of true diabetes with typical symptoms and hyperglycemia is a more frequent occurrence during pregnancy than the occurrence of pregnancy in a diabetic individual.[5] Strouse and Daly[6] suggest that some women are diabetic only during pregnancy. In Perez's[7] case, recovery from an apparent diabetes took place with the disappearance of symptoms during the puerperium, while in three of Joslin's[8] cases showing subsidence of symptoms after confinement, true diabetes ultimately developed.

The following case report illustrates in a striking manner the two conditions mentioned here: namely, the appearance of diabetes in a woman who constantly bore very large babies, and the apparent subsidence of the diabetic state after confinement.

REPORT OF CASE

Mrs. B., aged 35, was first seen by one of us (J. R. M.) in September, 1922, when two months pregnant. There was no history of diabetes in the family. The patient had five sisters

1. Bowen, B. D.: Pregnancy and Diabetes, New York State J. Med. **27**: 351 (April 1) 1927.
2. Springer, A.: Zur Frage: Diabetes und Schwangerschaft, Zentralbl. f. Gynäk. **48**: 2642 (Aug. 2) 1924.
3. Joslin, E. P.: The Treatment of Diabetes Mellitus, ed. 4, Philadelphia, Lea & Febiger, 1928, p. 870.
4. Joslin: The Treatment of Diabetes Mellitus, pp. 870, 824.
5. Joslin: The Treatment of Diabetes Mellitus, p. 862.
6. Strouse, Solomon; and Daly, P.: Diabetes and Pregnancy, M. Clin. North America **9**: 1491 (May) 1926.
7. Perez, M. L.: Diabetes en el embarazo, Semana méd. **2**: 393 (Aug. 24) 1922.
8. Joslin: The Treatment of Diabetes Mellitus, p. 866.

and three brothers, all living and well. She thought that all had been of normal size at birth, with the exception of one sister who had weighed 14 pounds (6,350 Gm.). The personal history was unimportant. Physical examination yielded normal observations. She had had three normal pregnancies, giving birth to babies said to have weighed 12, 15½ and 14 pounds (5,443, 7,030 and 6,350 Gm.). During March, 1922, she had had a miscarriage at three and a half months.

The present pregnancy progressed normally; specimens of urine did not contain sugar, and the patient was delivered at term of a baby weighing 12 pounds 2½ ounces (5,514 Gm.).

During 1924 the patient became pregnant for the sixth time, and after a normal gestation bore a baby weighing 12 pounds 2 ounces (5,500 Gm.). The seventh pregnancy occurred during 1925, and the patient got along well until the sixth month, when she complained of increased thirst, increased frequency of urination, and weakness. Specimens of urine had been sugar-free until this time, but on Feb. 12, 1926, a single specimen of urine contained 3.0 per cent of reducing substance, and the venous blood sugar reading was 0.2 per cent four hours after breakfast.

At this time the patient was seen by Dr. Bowcock. Her height was 66 inches (167.6 cm.), and her weight was 161¼ pounds (73.7 Kg.). The fasting venous blood sugar was 0.17 per cent by the method of Folin-Wu. The urinary reducing substance was dextrorotatory in the polariscope and was fermented by yeast. There was no evidence of acidosis. On a diet of carbohydrate 80 Gm., protein 70 Gm., and fat 75 Gm., 45 units of insulin daily was required to render the patient's urine sugar-free. In view of the facts that the patient already had five children, that her babies had always been very large, and that an apparently rather severe diabetes of recent onset was being controlled with difficulty, it was considered advisable to terminate the pregnancy. Labor was induced, February 18, the patient giving birth to nonviable female twins, each weighing a little over 3 pounds (1,360 Gm.). An uneventful recovery was made and four days later the diet was changed to carbohydrate 65 Gm., protein 65 Gm., and fat 160 Gm., on which diet the urine remained sugar-free with 35 units of insulin daily. One month later the patient was remaining sugar-free while taking this diet without insulin, and the fasting blood sugar was 0.13 per cent on two occasions. Shortly after this, contrary to advice, the patient ceased diet restriction but got along well, suffering no symptoms of diabetes.

The patient was next seen, Dec. 28, 1927, when two months pregnant. A fasting blood sugar was 0.115 per cent, and repeated subsequent specimens of urine were sugar-free. When she was six months pregnant, sugar again appeared in the urine. At this time the patient consulted Dr. J. E. Paullin in regard to the diabetic condition, and he has kindly furnished the remaining data:

The patient's weight was 155 pounds (70.3 Kg.). There were no symptoms of diabetes. In twenty-four hours, 1,800 cc. of urine contained 2.5 per cent of reducing substance. The fasting venous blood sugar was 0.17 per cent. On a restricted diet, without insulin, she was usually sugar-free, although she was not cooperative. June 22, 1928, an abscess appeared below the nipple of the right breast; this was incised and healed gradually. August 7, she was delivered at term of a baby weighing 13 pounds 7½ ounces (6,109 Gm.). Since delivery she has disregarded medical advice but has gotten along well while taking a practically unlimited diet and has had no further symptoms of diabetes. All of the children are oversize in respect to height and weight.

COMMENT

In addition to presenting two interesting phases of diabetes, this case illustrates several points which have been stressed by Joslin. The first of these is that diabetes should be energetically and carefully handled as soon as it is discovered, since the disease may be arrested in a mild state from which some recovery may take place. We do not mean to imply that therapeutic abortion is indicated simply because of the appearance of diabetes. Secondly, one should exercise great caution in pronouncing a cure in a patient who has been definitely diabetic, as the disease is likely to reappear under any circumstance unfavorable to the organism. Finally, the diabetes that occurs during pregnancy should not suggest an unfavorable prognosis, as it often assumes a milder form after delivery if handled cautiously. Although exact data are not available for comparison, one receives the impression that in the case reported the diabetes was much milder in the last pregnancy than in the preceding one.

SUMMARY

A woman who always gave birth to very large babies developed diabetes with hyperglycemia during the last two pregnancies and required insulin for its control during one pregnancy. The diabetic state apparently subsided after both pregnancies.

478 Peachtree Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS ADOPTED THE FOLLOWING REPORTS.

H. J. HOLMQUEST, Secretary.

THE SALE OF SUNSHINE LAMPS TO THE PUBLIC

The Council on Physical Therapy has taken the stand that a sunshine lamp sold directly to the public should be so constructed that the radiant energy emitted shall not differ essentially from sunlight. Furthermore, the advertising and descriptive matter pertaining to such lamp should contain no curative claims nor mention of specific diseases.

In general, the Council believes that more conservative claims for the necessity of strong sunlight should be made by the manufacturers of lamps for home use, such statements being restricted to those which can be justified by conclusive scientific evidence. The Council is not convinced that human beings in health require the great amount of ultraviolet energy one is led to believe is the case from the advertising and descriptive matter pertaining to some of the so-called sunlamps sold to the public.

A number of the more responsible manufacturers have fully agreed with the opinion of the Council. The emission characteristics of their lamps are in essential agreement with the requirements established by the Council, and in their advertisements they carefully avoid making curative claims. Furthermore, in these advertisements attention is called to the advisability of consulting one's physician before exposing oneself to ultraviolet radiation.

From time to time the Council will publish reports on the sunlamps which conform to the requirements established by the Council. These reports will describe in detail the construction and operation of the lamps and will contain complete information on their electrical and emission characteristics.

A STATEMENT TO MANUFACTURERS OF PHYSICAL THERAPY EQUIPMENT

It has come to the attention of the Council on Physical Therapy that certain manufacturers make unscientific and unwarranted claims in advertisements which appear in publications other than those of the American Medical Association, while advertising the same equipment conservatively in publications of the Association. The Council hereby calls the attention of manufacturers of medical apparatus to the fact that all advertising must conform to the requirements of the Council if the apparatus is to remain acceptable to the Council.

The Council on Physical Therapy hereby notifies the manufacturers of physical therapy equipment that it will reject all apparatus for which, in its opinion, unwarranted and unscientific claims are made in any advertising or descriptive matter put out by the manufacturer.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

W. A. PUCKNER, Secretary.

DIGESTIVE ENZYMES FOR ORAL ADMINISTRATION OMITTED FROM N. N. R.

As a result of the replies to a questionnaire sent to the members of the American Gastro-Enterological Association, W. A. Bastedo reported (THE JOURNAL, Sept. 5, 1925) that many members of the Association do not prescribe digestive enzymes, while those who do employ such enzymes confine their use almost wholly to cases of demonstrated or believed enzyme deficiency; almost all who prescribe them show no great enthusiasm over the results of their use, except possibly in the case of pancreatin in proved pancreatic deficiency.

In consideration of the replies to the questionnaire, the Council decided at that time to continue the acceptance of gastric ferment preparations, including those intended for internal administration, to await confirmatory evidence in favor of their use.

No acceptable evidence showing the value of gastric enzymes when administered orally having become available, the Council voted to omit with the close of 1929 all digestive enzyme preparations save those recommended for use outside the body for the digestion of food previous to administration and locally for the softening of dead tissues or the solution of false membranes. The omission is therefore announced of Elixir of Enzymes (Armour & Co.); Essence of Pepsine-Fairchild, Gastron, Holadin and Diazyme Glycerole (Fairchild Bros. & Foster); and Panase (Frederick Stearns & Co.).

COMMITTEE ON FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COMMITTEE ON FOODS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

E. M. BAILEY.
EUGENE F. DU BOIS.
JULIUS H. HESS.
W. MCKIM MARRIOTT.
LAFAYETTE B. MENDEL.
GROVER F. POWERS.
H. C. SHERMAN.
MORRIS FISHBEIN, Chairman.

NOURON

Manufacturer.—Nouron Products Corporation, New York.

Patents.—The word Nouron is registered in the United States Patent Office.

Composition.—The ingredients used are soy beans, whole wheat flour and egg yolk in combination.

Claims.—Is a nutritious, digestible and palatable food prepared especially for assisting in the gradual change from a liquid to a solid diet, as for weaning babies and for convalescents.

MERRELL-SOULE WHOLE LACTIC ACID MILK POWDER

Manufacturer.—Merrell-Soule Company, Inc., New York.

Composition.—Is made from fresh whole milk obtained from healthy inspected cattle.

Analysis	Per Cent
Fat	28.00
Protein	26.50
Lactose	32.50
Mineral matter	6.00
Total acidity	5.00
Free lactic acid	4.25
Moisture	2.25

Process.—Is prepared from pure whole milk carefully pasteurized and then inoculated with a culture of *Streptococcus lactis*. If necessary, the milk is standardized so that the finished product will comply with the analysis indicated on the label. The whole milk is then partially condensed in a vacuum pan, immediately cooled and transferred to large vats, where it is inoculated with a fresh culture of pure *Streptococcus lactis*. The milk is incubated until the required amount of acid has developed and is then cooled to a low temperature and transferred to glass lined holding tanks. The final step is the complete drying of the cultured product on the Merrell-Soule spray process drier, where it is almost instantly converted into powder. The powder is then examined in the laboratory and, if satisfactory, is transferred to cans, carefully processed, and sealed.

Claims.—The dried product has the value of the freshly prepared lactic acid milk and, in addition, is uniform.

JELL-O

Manufacturer.—The Jell-O Company, Inc., Le Roy, N. Y. General Foods Corporation, Successor-Manufacturer.

Composition.—A mixture of pure gelatin, cane sugar, pure fruit flavor, fruit acid from grapes and vegetable color.

Claims.—Complies with all pure food regulations.

CARNATION MILK

Manufacturer.—Carnation Milk Products Company.

Definition.—Carnation sterilized evaporated milk is cow's milk reduced to the consistency of cream by evaporating in vacuum and then thoroughly sterilized.

Composition.—Carnation Milk is evaporated milk, homogeneous and sterilized. It is produced under sanitary conditions and is sealed in clean, air-tight cans. Sixty per cent of the water is removed.

Claims.—It contains the vitamins that any cooked milk is depended on to supply, needing such supplements as orange juice and cod liver oil.

NEW OATA

Manufacturer.—Ralston Purina Company, St. Louis.

Composition.—Contains rolled oats and precooked rolled wheat. A combination of precooked rolled wheat flakes and quick cooking rolled oats.

Claims.—Provides iron, phosphorus and the constituents of these grains in a form permitting rapid cooking.

PURINA WHOLE WHEAT FLOUR

Manufacturer.—Ralston Purina Company, St. Louis.

Composition.—Whole wheat.

Claims.—Whole grains are rich in iron, phosphorus and other minerals. Purina Whole Wheat Flour is made from whole wheat, providing these body-building essentials.

CHECKR-CORN FLAKE

Manufacturer.—Ralston Purina Company, St. Louis.

Claims.—Provides flavor and variety appealing to the appetite.

RALSTON WHEAT FLAKES

Manufacturer.—Ralston Purina Company, St. Louis.

Composition.—Whole wheat.

Claims.—Provides nourishing food in appetizing form. Is especially nourishing because it contains every bit of the wheat, bran and all. Vitamins, mineral salts and proteins remain.

RALSTON (THE WHOLE WHEAT CEREAL)

Manufacturer.—Ralston Purina Company, St. Louis.

Patents.—Patent for display feature applied for. Trade mark registered, U. S. Patent Office.

Composition.—Ralston is choice hard winter wheat; contains the wheat embryo, with its vitamins.

Claims.—The whole wheat berry supplies the elements for healthy growth. The six outer layers of the wheat berry supply more than ten times as much minerals as in the starchy center; proteins; phosphorus; iron; roughage; vitamins.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

Cable Address : : : : "Medic, Chicago"

Subscription price : : : : : Seven dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, JUNE 14, 1930

METABOLISM DURING THE REPRODUCTIVE CYCLE

The conclusion that notable metabolic demands are made on the maternal organism during the reproductive cycle is well founded both on animal experiments and on clinical observation of women during the child bearing and child rearing stages. Indeed, some of the established facts lead one to ask whether the modern science of nutrition cannot contribute to the improvement of conditions that often arise in the course of pregnancy and lactation. It has been clearly demonstrated, for example, that, despite liberal feeding during the period of lactation, cows yielding large amounts of milk are likely to experience considerable drains on their stores of calcium. Accordingly, it has been remarked [1] that it is important to know whether certain losses manifest themselves in the mother herself or in her offspring. Furthermore, it is essential to learn whether specific care, the right kind and amount of exercise, good hygiene, a satisfactory state of mind, and an adequate dietary can reduce the untoward effects that may be revealed in the mother and reflected in the child during the reproductive cycle. In other words, can the mother be given a preparation for child bearing and child rearing that will benefit both her and the child?

The studies of Macy and her collaborators at the Merrill-Palmer School in Detroit on women during pregnancy indicate anew that, in spite of a large consumption of calcium and phosphorus, excessive excretion occurred. The determination of the fixation of these elements in the growing fetus and its adnexa affords some indication of the additional requirements imposed by pregnancy. The studies at Detroit as well as those of Coons and Blunt [2] at Chicago demonstrate anew that most women tend to draw on their own reserves to meet the fetal needs. The amount of calcium in the diet is often a limiting factor in the mineral balance. In spite of an adequate supply of minerals in the diet, the acid-base equilibrium of the body and the acid-base properties of the food have their influence on the retention or paths of excretion of calcium, thus determining the positivity or negativity of the balance. Shohl, in discussing the acid-base equilibrium of the body, states that the use of alkaline diets is strongly indicated in pregnancy and lactation. It appears that the body is capable of more sustained effort in maintaining equilibrium on such diets than on acid diets.

Observations recently recorded by Hunscher [3] for lactation cycles in women showed negative calcium and phosphorus balances in the early period in spite of large intakes of these elements. After six months of continued high milk production, appreciable increases in the loss of calcium were observed. Fecal excretion played a prominent part in the depletion, the amount in the feces at times exceeding the total intake. Phosphorus results were variable. In late lactation, when less milk was secreted, both calcium and phosphorus were stored in the maternal body.

The upshot of the extensive investigations referred to is that women who had experienced long physiologic demands from frequent pregnancies and prolonged abundant milk flow were in negative calcium and phosphorus balances at the sixth and twenty-seventh weeks of lactation. Although consuming diets superabundant in food constituents, with from 3 to 4 Gm. each of calcium and phosphorus, 27.8 to 29.4 Gm. of nitrogen, and 3,700 to 4,700 calories a day, they had progressively lost calcium and phosphorus in appreciable excess of their intakes during the first six months after parturition. Evidently during the reproductive cycle many factors, both negative and positive, operate to inhibit the optimal utilization of calcium and phosphorus in the maternal organism. Hence, as has been pointed out,[4] the protection of the maternal organism during this period of augmented physiologic activity demands better methods of bringing about adequate digestion, absorption and utilization of all food constituents. It might be expected that supplementary intakes of certain vitamins, notably those believed to be concerned with mineral metabolism, would improve the nutritive conditions under discussion. Macy, Hunscher, McCosh and Nims therefore added such supplements to the customary home diets of a few nursing mothers. Daily feedings of 15 Gm. of cod liver oil and 10 Gm. of yeast over a period of two months when the milk flow persisted at its highest

1. Macy, Icie G.; Hunscher, Helen A.; Nims, Betty; and McCosh, Sylvia S.: Metabolism of Women During the Reproductive Cycle: I. Calcium and Phosphorus Utilization in Pregnancy, J. Biol. Chem. **86**: 17 (March) 1930.

2. Coons, Callie M., and Blunt, Katharine: The Retention of Nitrogen, Calcium, Phosphorus and Magnesium by Pregnant Women, J. Biol. Chem. **86**: 1 (March) 1930.

3. Hunscher, Helen A.: Metabolism of Women During the Reproductive Cycle: II. Calcium and Phosphorus Utilization in Two Successive Lactation Periods, J. Biol. Chem. **86**: 37 (March) 1930.

4. Macy, Icie G.; Hunscher, Helen A.; McCosh, Sylvia S., and Nims, Betty: Metabolism of Women During the Reproductive Cycle: III. Calcium, Phosphorus and Nitrogen Utilization in Lactation Before and After Supplementing the Usual Home Diets with Cod Liver Oil and Yeast, J. Biol. Chem. **86**: 59 (March) 1930.

rate stimulated better calcium and phosphorus utilization in all cases studied. Obviously, such limited records are utterly inadequate for any final pronouncements on the value of "forcing" the intake of vitamin-bearing foods during the reproductive cycle, particularly in view of the demonstration by Hart, Steenbock, Kline and Humphrey [5] that irradiated yeast, potent in vitamin D, showed no positive influence in improving the lime assimilation of liberally milking cows receiving a ration of alfalfa hay, corn silage, grains and grain by-products, although vitamin C was absorbed into the blood, as evidenced by the enrichment of the milk in this factor.

Further studies are timely and imperative. The feeding of pregnant mothers remains largely empiric, with marked tendencies to restrictions assumed to promote easy delivery of the new-born. Under the existing uncertainties it seems worth while to repeat these well considered words: [1]

> There are many apparent and variable biological processes operating during the period of pregnancy; their influence is known to be far reaching and inadequately understood. In all probability there are many yet unrecognized factors significant in the metabolism of women during the reproductive cycle. It is the accumulation and recording of many and diverse data on the same individual and on different individuals in various stages of gestation that will ultimately reveal the functions and physiological processes peculiar to the progression of the human reproductive cycle.

THE BEHAVIOR OF MERCURY IN THE BODY

The presence of mercury in the body invariably presents a problem to the physician regardless of whether the element has been introduced into the organism for therapeutic purposes or occurs as a consequence of poisoning. It is a potent agent that may play havoc with the cells and tissues of the host as well as exert destructive influence on undesirable microbiotic invaders. Like some other metals, mercury is a cumulative poison; it is readily deposited in the bones and the liver. When it is mobilized for transport it may injure various organs, notably the kidneys and the liver. Consequently the clinician becomes concerned with the rate of migration of mercury, the quantity that is circulating freely at any time, and the rate at which it may be passing through the susceptible organs of excretion. Until comparatively recently the best guide to treatment in the case of actual intoxication with mercury was expressed in the vague admonition to facilitate elimination of the metal through the bowels, kidneys and skin.[6]

Mercury and lead have many chemical reactions in common. Accordingly, some attention has been devoted recently by students of mercurial intoxication to the methods that have proved to be effective in the management of lead poisoning. Lead deposits readily in the bones. The principle developed by Aub and Minot has been to reduce the excretion of lead as much as possible during the acute stage of intoxication and thus spare the sensitive tissues to the utmost. This can evidently be accomplished by facilitating deposition of calcium in the bones. Calcium is administered liberally in the form of milk or of a simple calcium salt. After disappearance of acute symptoms, such a diet should be replaced by one containing as little calcium as possible. Administration of acids or potentially acid salts, such as ammonium chloride, thereupon produces a negative calcium balance and thus tends to liberate lead from the bones.[7]

The behavior of mercury seems to be analogous to that of lead in several respects. According to studies of Young, Taylor and Merritt [8] at the Boston City Hospital and the Harvard University Medical School, a diet rich in calcium (or alkali) diminishes, while one containing much acid (ammonium chloride) increases, the rate of elimination of mercury, the response being much more pronounced to acid than to alkali. It would appear at present, however, that mercury does not respond as rapidly to the ingestion of alkali as does lead. This might be predicted from a study of the difference in the amphoteric properties of the two elements. Administration of large doses of calcium lactate are not sufficient to inhibit completely the excretion of mercury, in contrast to the complete inhibitory effect of similar doses on the excretion of lead. Further studies will be necessary to determine how completely the excretion can be inhibited by the administration of alkali and how completely the mercury can be removed from the body by the administration of acid. However, it would appear to the Boston investigators that in acute mercurial intoxication the kidney, liver and other organs might be spared were the patient given large amounts of calcium and thereby allowed to excrete the mercury more slowly.

These studies have an obvious bearing on the therapeutic use of mercury. During active medication with mercury, its storage might be retarded by prohibition of the use of foods rich in calcium or other alkalis. It may become possible to prevent storage of mercury and obtain the same therapeutic effect by giving the patient an acid diet, fewer injections and a smaller amount of mercury. The degree to which tissues act as a reservoir for mercury depends in no small measure on the hydrogen ion content of the blood, which in turn may be influenced by the food intake. As Young, Taylor and Merritt point out, the bone and liver serve as a reservoir for the unexcreted mercury. Obviously, prolonged administration of mercury, especially when

5. Hart, E. B.; Steenbock, Harry; Kline, O. L., and Humphrey, G. C.: Dietary Factors Influencing Calcium Assimilation: XIII. The Influence of Irradiated Yeast on the Calcium and Phosphorus Metabolism of Milking Cows, J. Biol. Chem. **86**: 145 (March) 1930.

6. Compare Wright, W., in Cecil's Textbook of Medicine, Philadelphia, W. B. Saunders Company, 1927.

7. Aub, J. C.; Fairhall, L. T.; Minot, A. S., and Reznikoff, Paul: Lead Poisoning, Medicine **4**: 17 (Feb.-May) 1925; Baltimore, Williams & Wilkins Company, 1926.

8. Young, A. G.; Taylor, F. H. L., and Merritt, H. H.: The Distribution and Excretion of Mercury, Arch. Dermat. & Syph. **21**: 539 (April) 1930.

the subject is on an alkaline diet, results in the deposit in the body of a large amount of mercury, which may be released suddenly by any reaction that lowers the hydrogen ion concentration of the blood or tissues. This is a potential source of mercurial intoxication. It is desirable, therefore, to control the diet of the patient during the administration of therapeutic doses of mercury, and in mercury intoxication to force alkalis and fluids.

CONGRESS AMENDS PORTER NARCOTIC BILL

The Porter narcotic bill to reorganize the federal narcotic service, H. R. 11143, amended to meet the only major objection raised against it on behalf of the American Medical Association, was passed by the Senate, June 5. The House of Representatives has agreed to the amendment, and the bill is now before the President for approval. If approved, it will become effective at the expiration of thirty days. The amendment made at the instance of the Association requires the Secretary of the Treasury to cooperate with the states in enforcing state laws to prevent the abuse of narcotic drugs and to cooperate, if necessary, in the formulation of state legislation to accomplish that end. The companion Porter narcotic bill, H. R. 9054, which proposes that the federal government take over the functions of the states with respect to the control of narcotic drugs and narcotic addiction, is thus left without justification or excuse for its enactment.

The request made on behalf of the American Medical Association for the incorporation in the bill of an amendment to the Narcotic Drugs Import and Export Act to permit the importation, for use in research by accredited laboratories, of derivatives of opium and coca leaves not obtainable in the United States, brought from the manufacturers of narcotic drugs in this country an agreement to manufacture any such derivative, whenever needed, in such quantities as may be desired for the purpose named. The suggested amendment was therefore not incorporated in the act.

The act passed creates a bureau of narcotics in the Treasury Department and provides for the correlation of its activities with those of the bureau of customs, the Public Health Service and the narcotic services of the several states. The Federal Narcotics Control Board is abolished. The functions of that board, which relate solely to the importation and exportation of opium and coca leaves and their derivatives, and the functions of the bureau of prohibition so far as they relate to the enforcement of the Harrison Narcotic Act, are transferred to the new bureau. The bureau of narcotics will be under the supervision and control of a commissioner of narcotics, appointed by the President, by and with the advice and consent of the Senate, at a salary of $9,000 a year. The act authorizes the appointment by the Secretary of the Treasury of a deputy commissioner of narcotics, without reference to the civil service laws. The qualifications necessary for the appointment of either of these officers are not specified. Officers and employees of the bureau of narcotics may be vested with the authority of customs officers and employees and assigned to duty at ports of entry and other places, in order more effectually to check the smuggling of narcotic drugs into the United States. The Surgeon General of the Public Health Service is authorized to study and investigate the abuse of narcotic drugs. He is required to estimate the quantities of crude opium and coca leaves, and their salts, derivatives and preparations, necessary to meet the normal and emergency needs of the United States, such estimates to be available for the guidance of the commissioner of narcotics in determining the quantities of crude opium and coca leaves that may lawfully be imported. The Surgeon General is authorized also to study the prevention and treatment of mental and nervous diseases, and the narcotic division in the office of the Surgeon General is hereafter to be known as the division of mental hygiene.

Although the companion Porter narcotic bill, H. R. 9054, pending in the House of Representatives, still carries the menace of a federal narcotic dictator, amendment has purged of that threat the bill just passed. As it now stands, it is susceptible of use as an effective agent for the building up of powerful and well coordinated federal and state machinery for the supervision and control of narcotic drugs and narcotic addiction. How far it will accomplish that result will depend on the wisdom of the President in the selection of the Commissioner of Narcotics and the wisdom of the Secretary of the Treasury in appointing a deputy commissioner. The medical profession is ready to do its part.

COLOSTRUM ANTIBODIES

The demonstration that placental transmission of tuberculosis rarely occurs in cattle at once suggested to the dairy industry a practical method of control of tuberculosis by immediate separation of new-born calves from infected mothers. A strict application of postnatal quarantine, however, was found impracticable. Calves isolated at birth from infected mothers and placed on an artificial diet develop diarrhea, exudative arthritis and inflammation of the umbilical stump, which usually end fatally within a week. In spite of great care, Smith and Little [1] were unable to rear more than one calf out of six after early segregation. Pathologic examination of quarantined calves dying during the first week showed death usually due to fulminating infection with *Bacillus coli* or with other environmental micro-organisms usually classed as harmless saprophytes. Apparently the new-born calf is wholly lacking in the normal adult defense against these micro-organisms.

A less rigid quarantine, however, is practicable, though, of course, attended with considerable risk of

1. Smith, Theobald; and Little, R. B.: The Significance of Colostrum to the New-Born Calf, J. Exper. Med. 36: 181 (Aug.) 1922.

postnatal infection with tuberculosis. In this less rigid technic the new-born calf is left with the infected mother till after its first natural feeding. After a single meal of maternal colostrum, the calf becomes practically immune to *B. coli* and other environmental saprophytes and can be safely reared on a quarantine diet.

The nature of the apparently necessary colostral protection has but recently been determined. It is generally assumed by the dairy industry that the colostrum acts as a preliminary cathartic, causing evacuation of presumably toxic fetal fluids and solids from the stomach and intestine. Some dairymen have even gone so far as to suggest castor oil as a substitute. Immunologists, however, have usually assumed that, in addition to this possibly necessary cathartic action, colostrum contains specific or nonspecific antibodies, and that its main function is a postnatal compensation for deficient placental transmission of adult humoral immunity. The current researches of Drs. Theobald Smith and Ralph B. Little [2] of the Rockefeller Institute are confirmatory of this view. In place of an initial colostrum feeding, these investigators gave new-born calves one or more preliminary feedings with normal cow serum or with the serum of cows immunized against *B. coli.* In experiments extending over a period of three years, they report that after this initial serum feeding only one calf in ten dies of *B. coli* infections.

These experiments suggest that serum antibodies and colostrum antibodies are chemically identical. Quantitatively, however, they differ greatly. While 0.1 cc. of colostrum is sufficient to protect a guinea-pig against a surely fatal dose of *B. coli,* 2 cc. of normal cow serum is insufficient for this protection. Normal milk also is of low protective titer.[3] The physiologic mechanism by means of which protective hormones are locally synthesized or locally mobilized in the colostrum has not yet been determined.

Current Comment

ALLERGY AND BRAIN CAPACITY

Many asthmatic children, owing to a large number of attacks, are out of school from a third to a half of the time, yet records show that they pass their school grades. Some educators have seen in this fact a suggested correlation between cutaneous hypersensitiveness and mental capacity. Balyeat [4] has compared the Otis-Terman intelligence quotient of a fairly large group of allergic children with a similar number of nonallergic pupils from the same schools. While 10 per cent of the nonallergic children were mentally subnormal, none of the children with a positive allergic skin reaction were thus handicapped. Seventy per cent of the cutaneously hypersensitive pupils were classed in his data as mentally "superior," "very superior" or "near genius," as contrasted with but 25 per cent of the control nonallergic pupils above average mental capacity. In his data, positive cutaneous hypersensitiveness indicates a 2:1 probability of superior mental capacity. The explanation of this alleged cutaneous-psychic correlation is beyond the horizon of present neurophysiology. It may be coincidence; perhaps it is an indication of a correlation between increasing development of the brain and complexity of the tissue cell.

2. Smith, Theobald; and Little, R. B.: The Immunological Significance of Colostrum: II. The Initial Feeding of Serum from Normal Cows and Cows Immunized Toward B. coli in Place of Colostrum, J. Exper. Med. **51**: 483 (March) 1930.

3. Smith, Theobald: Immunological Significance of Colostrum: I. The Relation Between Colostrum, Serum and the Milk of Cows Normal and Immunized Toward B. Coli, J. Exper. Med. **51**: 473 (March) 1930.

4. Balyeat, R. M.: The General Health and Mental Activity of Allergic Children, Am. J. Dis. Chil. **37**: 1193 (June) 1929.

ACCEPTED AND NONACCEPTED VIOSTEROL PREPARATIONS

When the question of accepting preparations of irradiated ergosterol arose, the Council on Pharmacy and Chemistry adopted a common name, viosterol, for this product. This name is not protected by trademark or copyright. It appears to have been generally adopted and is used by all manufacturers whose products have been accepted by the Council, with modifications to indicate composition and strength in vitamin D, as Viosterol in Oil 100 D and Cod Liver Oil with Viosterol 5 D. These products are all required to be physiologically standardized according to the method given in New and Nonofficial Remedies and may be relied on to have the composition and antirachitic strength claimed on the label. Therapeutic claims other than those permitted by the Council are not made for them. While it is desirable that the short, concise descriptive name viosterol be generally adopted to designate irradiated (activated) ergosterol, there is a danger that it may be used in connection with some preparations in such a way as to give the impression that a product that has not been considered or accepted is one of those accepted for inclusion in New and Nonofficial Remedies. Such a case has recently been the subject of litigation. A firm in Kansas City has been marketing "Meed Viosterol Tablets," claimed to be an "antirachitic concentrate, physiologically standardized to 100 times the potency of cod liver oil" and recommended "for lowered body vigor, vitality, nervousness, malnutrition, underweight, colds and lowered blood count. Recovery from illness. All vitamin D deficiency." The firm, at the suit of Mead Johnson & Company, whose Mead's Viosterol in Oil 100 D is licensed by the Wisconsin Alumni Research Foundation and accepted by the Council on Pharmacy and Chemistry, was compelled by court order to cease using the name "Meed"; but it is still permitted to market the product as "Riley's Tablets (Viosterol)" apparently with the same exaggerated claims. Since the product is not licensed by the Foundation nor accepted by the Council, and since the firm presents no evidence, save for the bare assertion, there is no means of knowing that it has any antirachitic potency whatever. No tablet concentrate of viosterol has been submitted for acceptance by the Council. The physician has only one defense in such a situation. In order not to waste his time and his patient's money (or worse) by using a product

of unknown strength or composition, he should make certain that the product he prescribes is accepted by the Council on Pharmacy and Chemistry. This can be determined by a statement to that effect on the label of the product, by the occurrence on the label or trade package of the seal which the Council permits the manufacturers of accepted products to use, or by direct inquiry to the headquarters of the Association.

Association News

THE DETROIT SESSION

The Scientific Exhibit

Admission to the Scientific Exhibit will be extended only to those who have official badges or admission cards. For the benefit of the local nurses and technicians who desire to see the Scientific Exhibit, admission cards are available. These will be good only for the person in whose name the card is issued and good only on the day stated. In order to obviate a peak attendance on any one day, it is requested that nearby hospitals whose nurses expect to attend the Scientific Exhibit shall forward their request for admission cards *immediately* to the Director of the Scientific Exhibit, 535 North Dearborn Street, Chicago. These requests should contain:

1. The name of the nurse to whom the card is to be issued.
2. The day of the week on which she wishes to attend.

Only one card will be issued to each person.

Medical Veterans' Dinner

Surg. Gen. M. W. Ireland of the U. S. Army will be the guest of honor at the annual meeting and dinner of the Medical Veterans of the World War, which will be held at 7:30 Sunday evening, June 22, in the Italian Garden of the Book-Cadillac Hotel. There will be a short musical program and the principal address will be given by Dr. Aristides Agramonte of the University of Havana. For detailed information write Dr. Burt R. Shurly, 62 Adams Avenue West, Detroit.

Hotel Reservations

The Subcommittee on Hotels of the Local Committee on Arrangements sends assurance that there are plenty of rooms in modern hotels in Detroit, within easy walk of Grand Circus Park, and that those attending the annual session can secure good hotel accommodations. Reservations may be made by addressing Dr. William C. Lawrence, 1805 Stroh Building, Detroit.

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts at 10 o'clock, daylight saving time, Monday, Thursday and Saturday; at 10:15 on Tuesday, and at 9:45 on Wednesday and Friday, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of June 16-21 is as follows:

June 16. Making Food Attractive for the Sick.
June 17. Health Hints for Motorists.
June 18. Swimming Holes—Old and New.
June 19. Tuberculosis Treatment Modernized.
June 20. A Child Is to be Born.
June 21. A Modern Medicine Man and the Hygiene of Old Age.

Five Minute Health Talks may be heard over the Columbia Broadcasting System daily from 1 to 1:05, daylight saving time.

The program for the week is as follows:

June 16. Diabetes Mellitus.
June 17. A Vacation for Health.
June 18. Keeping Cool in Hot Weather.
June 19. The Cost of the Common Cold.
June 20. What We Know About Foods.
June 21. Keeping Cool in Hot Weather.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Personal.—Dr. Jesse D. Riley, formerly of El Paso, Texas, has been appointed superintendent of the Arkansas Tuberculosis Sanatorium, Booneville.——Dr. Barton A. Rhinehart, Little Rock, won the Dewell Gann cup in the golf tournament at the annual meeting of the Arkansas Medical Society in Fort Smith, with a score of 70.

Society News.—Dr. Thomas B. Sellers, New Orleans, addressed the Pulaski County Medical Society, April 28, on "Treatment of Nausea and Vomiting of Pregnancy and Eclampsia."——The Bradley County Medical Society devoted its meeting, April 7, at Warren to an all day clinic on bone and skin diseases.——Among others, Dr. Henry T. Smith, McGehee, addressed the Desha County Medical Society, April 22, on "X-Ray Findings in Negro School Children."

CALIFORNIA

Sudden Rise of Poliomyelitis.—The report of twenty-seven cases of poliomyelitis for the first two weeks of May shows a marked increase in its prevalence. Most of these cases appeared in the southern part of the state, whereas in recent years the majority have been found in the northern sections. Since January 1, thirty-three cases have been reported in Los Angeles County and thirteen in San Bernardino. According to the state health department there has always been a pronounced increase in the prevalence of this disease in April and May of those years in which the disease rises to epidemic proportions during the late summer months. Physicians are cautioned to be on the lookout to detect suspicious cases and to remove patients from contact with other persons. The number of cases reported during 1930 was January, seventeen; February, three; March, twelve; April, sixteen, and May (first two weeks), twenty-seven—a total of seventy-five. In 1927, there were 1,298 cases, of which 433 were from counties in southern California. An increased incidence of the disease in southern California may be regarded with apprehension, as it is supposed that there are many susceptible persons because of the presence of a large number of nonimmune individuals in a section where the population has an extensive turnover.

DISTRICT OF COLUMBIA

Personal.—The degree of doctor of laws will be conferred by Georgetown University in June on Dr. William Gerry Morgan, Washington, President-Elect of the American Medical Association, and a few days later the degree of doctor of science will be conferred on him by Dartmouth College.

GEORGIA

Society News.—The Fourth District Medical Society was addressed at Carrollton, recently, among others, by Drs. Enoch Callaway, LaGrange, on "Curability of Cancer," and Allen H. Bunce, Atlanta, "Carcinoma of the Colon—Importance of Early Diagnosis."—"Heart Disease" was the subject of Dr. Henry C. Sauls, Atlanta, before a meeting of the Spalding County Medical Society at Griffin, April 16.

ILLINOIS

Society News.—The St. Clair County Medical Society was addressed, June 5, by Drs. William H. Vogt and Percy H. Swahlen, St. Louis, on "Normal and Pathologic Obstetrics."——Dr. Sidney A. Portis, professor of medicine, Loyola University School of Medicine, Chicago, conducted a medical clinic at St. Mary's Hospital, Quincy, May 12, before the Adams County Medical Society.

Infant Deaths Decline.—During the past year 7,907 babies less than 1 year of age died in Illinois, it is reported, while in 1918 the number was 13,109. During the intervening period the lowest number of infant deaths reported in any year was 8,333, the number for 1928. The average for the period was 10,025. The number of infant deaths last year fell 2,118 below the average for the year since 1918. The number of deaths per thousand births among babies less than a year old has dropped from 105.7 in 1918 to 61.5 in 1929, a decline of 41 per cent in the state.

Chicago

New Heart Clinic at University of Chicago.—The Baron Hirsch Woman's Club has pledged $10,000 toward the establishment of a cardiac clinic on the Midway as a part of the University of Chicago's clinics. The purpose of this clinic will be to keep in touch with every patient in whose history there is a record of heart disease. Transportation, food and lodging will be furnished to those in need. A survey will be made to secure part-time or light work for those who are able. The Baron Hirsch Woman's Club, one of the oldest Jewish clubs in Chicago, established one of the first convalescent homes in the city.

KANSAS

University Extension Course Goes to Physicians.—The University of Kansas School of Medicine is bringing graduate medical study to the practicing physician. The course, nine weeks on internal medicine, which opened June 4, is conducted by Drs. Lawrence D. Thompson and John V. Lawrence, St. Louis. The course will be given at Hutchinson, Salina, Beloit, Belleville, Marysville, Clay Center and Manhattan. A lecture will be held each week in these towns.

KENTUCKY

Society News.—Dr. Milton B. Cohen, Cleveland, addressed the Jefferson County Medical Society at Louisville, May 5, on "Principles and Their Application in the Diagnosis and Treatment of Asthma, Hay-Fever and Other Allergic Conditions."

LOUISIANA

Society News.—At the Southern States Conference of the American Social Hygiene Association in New Orleans, May 26-27, a committee of twenty, composed of physicians, clergymen and lay workers, was organized for the purpose of making a survey of social hygiene conditions in New Orleans. Dr. Henry W. E. Walther, New Orleans, was elected chairman and Mr. Charles C. Shedd, secretary.

MAINE

Society News.—The Cumberland County Medical Society, Portland, was addressed, May 2, among others, by Dr. Earl S. Hall, Portland, on "Physical Therapy in Tuberculosis."——The Lister Medical Club of Portland celebrated its thirty-eighth anniversary at the Columbia Hotel, Portland, May 15; of the eleven charter members only five are left: Drs. John W. Bowers, president, and Henry H. Brock, Edward J. McDonough, Willis B. Moulton and Stanley P. Warren.——The Kennebec County Medical Association was addressed, April 22, at Gardiner, by Drs. Estes Nichols, Portland, on "Treatment of Tuberculosis"; Clair S. Bauman, Waterville, "Some Essentials of Diet," and John O. Piper, Waterville, "Myocarditis."

MARYLAND

Appointment of Professors.—The following members of the faculty of Johns Hopkins University School of Medicine will become full professors in the schools indicated at the end of the present scholastic year: Drs. Bengt Hamilton, now associate professor of pediatrics, to be professor of pediatrics at the University of Chicago; Rustin McIntosh, now associate in pediatrics, to be professor of pediatrics at Columbia University College of Physicians and Surgeons, and George Sharp Eadie, now associate in physiology, to be professor of physiology at Duke University.

Department for Medical History at Johns Hopkins.—Joseph S. Ames, LL.D., president of Johns Hopkins University, recently announced a gift from the General Education Board, totaling $312,500, for the establishment of a department of the history of medicine. The sum is in addition to $750,000 previously given to build the William H. Welch Medical Library and $250,000 for the maintenance of the professorship in the history of medicine which is occupied by Dr. William H. Welch. The gift is given in the form of $12,500 for each of five years and then a capital sum of $250,000, making possible provision for other professorships in the department of the history of medicine. Since the library was first planned, it is reported, it has been the wish of the authorities at Johns Hopkins to create a full department to investigate the various branches of medical history. Dr. Welch is on his way to Pasadena, Calif., where he will spend several weeks making a study of the Harry E. Huntington Library, famous for its collection of books printed in the fifteenth, sixteenth and seventeenth centuries.

MICHIGAN

Society News.—Dr. Barney A. Credille, Flint, addressed the Shiawassee County Medical Society, May 15, on "The Modern Treatment of Asthma and Hay Fever."——Dr. Isidor Harrison Tumpeer, Chicago, addressed the Jackson County Medical Society at Jackson, May 20, on "The Simplicity of Infant Feeding and Other Hazards."——Dr. Walter J. Wilson, Detroit, addressed the Calhoun County Medical Society, Battle Creek, June 3, on "Rheumatic Heart Disease."——The Washtenaw County Medical Society was addressed, June 9, by Malcolm H. Soule, Sc.D., Ann Arbor, on some recent advances in immunization.——Dr. Fred C. Warnshuis, Grand Rapids, addressed the Berrien County Medical Society at St. Joseph, April 16, on "Practical Procedures in Head Injuries," and Dr. Jacob D. Brook, Grandville, on "Rendering Preventive Medicine to the Public."——"Acute Infections of the Pharynx, Neck and Mediastinum" was the subject of Dr. Albert C. Furstenberg, Ann Arbor, April 17, before the Lenawee County Medical Society.

MISSOURI

Society News.—A symposium on Hodgkin's disease was conducted, May 27, before the Jackson County Medical Society; the participants were Drs. Frederick C. Narr, Ira H. Lockwood, Emsley T. Johnson, Frank J. Hall, Robert Koritschoner, Ferdinand C. Helwig and Arthur E. Hertzler.——Dr. Norman M. Keith, Rochester, Minn., was the guest of honor at the annual smoker of the Kansas City Academy of Medicine, May 23; his subject was "Edema and Its Treatment."

NEW YORK

Society News.—The Medical Society of the County of Albany was addressed, May 28, by Drs. Nelson K. Fromm and Harold A. Peck, Albany, on "Progressive Facial Hemiatrophy" and "An Experiment in Color Photography," respectively.——The Medical Society of the County of Nassau was addressed, May 27, at the Hempstead City Club, Hempstead, by Dr. Ray McCune Bowles on "Early Diagnosis and Management of Upper Urinary Disorders."

New York City

Cancer Institute Organized.—Under the direction of Dr. John G. William Greeff, commissioner of the department of hospitals, the Brooklyn Cancer-Radium Research Institute is being organized for special cancer work which began, June 1, at the Cumberland Hospital. Dr. John E. Jennings is chairman of the organizing committee of the institute, which will be a holding corporation for the distribution of scholarship and research funds and for the distribution of funds where needed for cancer prevention.

Campaign Against Tuberculosis.—The city health department, it is reported, will inaugurate in the fall an antituberculosis campaign to examine 1,200,000 of New York's school children and 400,000 children of preschool age. An appeal will be made to county medical societies for members to consent to do this work for a definite and limited fee. A further aid will be the utilization of city health stations and of the department of hospitals' x-ray apparatus and the equipment of cooperating private hospitals. To aid in this work, Dr. Wynne has requested six new health stations and 200 additional departmental nurses to be brought on in groups of fifty every three months.

Fraudulent License Returned.—Dr. Harvey L. Daiell, Brooklyn, has returned his New York medical license number 23325, dated Jan. 31, 1929, obtained on the basis of fraudulent credentials from Northwestern University Medical School, and his 1930 annual registration certificate number 8930 to the department, and has resigned as a physician and surgeon in New York State. Daiell is said to have enrolled in University and Bellevue Hospital Medical College and attended through his sophomore year but did not continue his medical course at this school because he failed his second year at the end of both sessions, 1918-1919 and 1919-1920. Dr. Daiell graduated from the St. Louis College of Physicians and Surgeons in 1922, which school was involved in the diploma mill scandal of 1923, as the result of which its charter was revoked in 1926. He was born in Russia in 1899.

Twenty-One Million Dollars for City Hospitals.—The department of hospitals recently announced a hospital construction and improvement program to be carried over four years to involve an expenditure of $21,000,000. The immediate outlays will be for formulation of plans, architects' services and construction of new buildings. The plans include a $3,000,000 tuberculosis hospital for Brooklyn which will have 500 beds; a $3,000,000 general hospital for Brooklyn or Queens; $1,500,000 for additional facilities for the Cumberland Hospital, Brook-

lyn; $400,000 for improvements to the Fordham Hospital, and $400,000 each for new pavilions for Riverside and Willard Parker hospitals. The board sanctioned preliminary plans also for a new $600,000 hospital at Sea View, Staten Island. Health centers are included in a long time project, and $1,000,000 was set aside for each of four years. Immediate funds for the fight on cancer include $130,000 for the purchase of 2 Gm. of radium. This will bring the city's supply of radium to 7 Gm., since it already has 3 and will soon receive the loan of 2 more.

OHIO

Steuer Prize Awarded.—The Steuer Memorial Prize of $100 was awarded, June 6, to William A. Sommerfield, a junior in Western Reserve University School of Medicine, for work in the application of Simson's rule in higher mathematics to the determination of stomach volume. The prize was established as a memorial to Dr. Herbert S. Steuer, who was electrocuted, June 6, 1928, while making a roentgen examination of a patient; the income goes each year to an investigator who does meritorious work in the department of anatomy.

Society News.—The Adams County Medical Society was addressed, April 23, at West Union by Dr. Samuel J. Ellison, West Union, on "Work of the Commissioner of Health in Combating Tuberculosis."——Dr. Walter R. Griess, Cincinnati, addressed a recent meeting of the Clermont County Medical Society at Owensville, on "Medical and Surgical Aspect of Gastric Ulcer, with Special Reference to Medical Treatment."——"Hypertension with Some Newer Phases of the Circulation" was the subject of Dr. John E. Greiwe, Cincinnati, before a joint meeting of the Highland County and Five County medical societies.——Dr. Theodore F. Myler, Xenia, addressed the Greene County Medical Society, May 2, at Xenia on "Some of the Laboratory Aids to Diagnosis."——Among others, Dr. Curtiss Ginn addressed the Montgomery County Medical Society, May 2, at Dayton, on "Carcinoma of Buccal Mucous Membrane."——The Mahoning County Medical Society was addressed, April 24, by Dr. William H. G. Logan, Chicago, on "The More Common Surgical Lesions of the Mouth and Jaws, and a Brief Review of the Problem of Dental Focal Infections."——Drs. Harry M. Hall and Robert U. Drinkard, both of Wheeling, W. Va., addressed the Licking County Medical Society, April 25, on "Specialism" and "Surgery of the Chest," respectively.——Dr. James Craven Wood, Cleveland, was tendered a dinner, March 26, on the occasion of the fifty-first anniversary of his graduation from medical college. It was also the fifty-first anniversary of his wedding.——Drs. Herbert E. Smead and Walter W. Brand, both of Toledo, addressed the Toledo Academy of Medicine, June 6, on "Anaphylaxis from Scarlet Fever Serum" and "Rachitic Pelvis," respectively.

OREGON

Personal.—Dr. Richard B. Dillehunt has been elected president of the governing board of the Portland Child Guidance Clinic Association, articles of incorporation for which have just been completed (THE JOURNAL, May 31, p. 1769); Dr. Laurence Selling is the vice president.

PENNSYLVANIA

Personal.—Drs. Murray F. McCaslin, Columbia Hospital, Wilkinsburg, and Victor W. Eisenstein, Passavant Hospital, Pittsburgh, received first and second prizes, respectively, in the annual case report contest of the Allegheny County Medical Society.

Dr. Heckel Honored.—In the convocation held by Allegheny College, Meadville, Pa., in June the honorary degree of doctor of science is to be conferred on Dr. Edward B. Heckel, Pittsburgh, Chairman of the Board of Trustees of the American Medical Association.

Society News.—The Cambria County Medical Society was addressed, May 8, at Johnstown by Dr. Daniel J. McCarthy, Philadelphia, on "Arteriosclerosis and Its Effects on the Central Nervous System"; the society will be addressed, July 10, by Drs. Lyndon H. Landon, Pittsburgh, and Thomas H. Manley, Jr., Tarentum, on "Early Symptoms of Brain Tumors" and "Importance of the Ophthalmologist in the Diagnosis of Brain Lesions," respectively.——Dr. Frank C. Hammond, Philadelphia, addressed the Montgomery County Medical Society, June 4, at Norristown on "Medical Ethics and Pastoral Medicine"; the society was addressed, May 7, by Dr. Henry K. Mohler, Philadelphia, on "Diabetes Mellitus."——The Harrisburg Academy of Medicine will be addressed, June 17, by Dr. John P. Griffith, Pittsburgh, on "Gallbladder Disease with Its Various Manifestations." Dr. William W. G. Maclachlan, Pittsburgh, addressed the society, May 20, on "Some Clinical and Pathologic Manifestations of Psittacosis."——The Fayette County Medical Society was addressed, June 5, by Drs. Alexander M. Duff, Jr., Republic, and Ralph P. Beatty, Uniontown, on "Injection Treatment of Varicose Veins" and "Urinary Retention: Causes and Management," respectively.

Philadelphia

Personal.—Dr. Franz Alexander was guest of honor at a dinner, May 21, in the University Club. He arrived in this country from Germany, recently, to take a position in the psychology department at the University of Chicago.

Prize Offered in Pediatrics.—The Philadelphia Pediatric Society announced a prize competition to stimulate interest in pediatrics among the younger practitioners out of medical school less than six years and residing in the Philadelphia metropolitan area. Investigations and studies to be presented must be limited to pediatric subjects. The first prize is $100 and the second, $50. Completed papers must be in the hands of the secretary, Dr. John D. Donnelly, 115 Bryn Mawr Avenue, Bala-Cynwyd, Pa., not later than October 1.

Society News.—The Philadelphia Pediatric Society was addressed, June 10, by Dr. Harry Donald Cowlbeck on "A Discussion of a New Method of Pyelography by Intravenous Injection with Demonstration of X-Ray Films"; Drs. Eugene P. Pendergrass and Edward S. Thorpe, Jr., "A Preliminary Report on a Study of the Normal Thymus," and Drs. Douglas P. Murphy, Joseph Stokes, Jr., and Theodore S. Wilder, "A Demonstration of the Drinker Respirator with a Discussion of Its Usefulness."——The University of Pennsylvania Alumni Day will be held, June 13-14; there will be a medical alumni reunion and smoker.

SOUTH CAROLINA

Society News.—The Eighth District Medical Society was addressed, April 24, by Drs. Francis X. Mulherin, Augusta, Ga., on baby feeding, and Samuel Harmon, Columbia, on infections of the teeth and their relation to other diseases; Dr. Hugh E. Wyman, Columbia, presented a case report.

SOUTH DAKOTA

State Medical Election.—Dr. Percy D. Peabody, Webster, was installed as president of the South Dakota State Medical Association at its annual meeting, May 20-22, and Dr. Willard A. Bates, Aberdeen, was made president elect. Dr. John F. D. Cook, Langford, was reelected secretary. The next annual session will be held at Aberdeen, June 2-4, 1931.

TENNESSEE

Personal.—Dr. Eugene R. Kellersberger, who for fourteen years has been a medical missionary in Africa, recently told of his work in the dispensary at Bibanga. Dr. Kellersberger, who was addressing a meeting at a church in Nashville, is said to have treated 6,000 cases of sleeping sickness in the Belgian Congo.

Tuberculosis Decreases.—The tuberculosis death rate in Tennessee is reported to have been the lowest (122.6) in the history of the state in 1929. It was also reported that for the first time the white death rate in the state was below 100, the figures being 96.4, as compared with the rate 100.2 in 1928. The Negro rate in 1929 was 252.1, as compared to 291.4 in 1928.

TEXAS

Health at San Antonio.—Telegraphic reports from sixty-five cities with a total population of 30 million, for the week ended May 31, indicate that the highest mortality rate (25.3) was for San Antonio, and the mortality rate for the group of cities as a whole, 11.6. The mortality rate for San Antonio for the corresponding week last year was 16, and for the group of cities, 12.8. The annual rate for sixty-five cities was 13.7 for the twenty-two weeks of 1930, as against a rate of 14.9 for the corresponding weeks of 1929. Caution should be used in the interpretation of weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population, may tend to increase the death rate.

VIRGINIA

Hospital News.—Plans have been completed for a four story annex to Grace Hospital, Richmond, to cost approximately $75,000; the annex will double the size of the hospital and is expected to be ready for occupancy about November 1.

Personal.—Carl C. Speidel, Ph.D., associate professor of anatomy, University of Virginia Department of Medicine,

Charlottesville, was awarded the President and Visitors' Research Prize of $100 for his work on Hyperthyroidism; the prize was offered for the best paper on research in the University of Virginia during 1929.

WASHINGTON

Society News.—The King County Medical Society was addressed at Seattle, June 2, by Drs. Julius A. Weber on "Pulmonary Atelectasis"; Charles R. Castlen, "Spontaneous Pneumothorax," and William Snow Miller, Madison, Wis., "Some of the Anatomic Relations of Tuberculosis."—— Dr. Alfred E. Lange, Walla Walla, addressed the Spokane City and County Medical Society, May 8, on "Personal Observations in Epidemic Cerebrospinal Meningitis," illustrated.—— Dr. Donald A. Nicholson, Seattle, was reelected president of the Washington Society for Mental Hygiene at its meeting in Seattle, May 20.

WEST VIRGINIA

Personal.—The degree of doctor of public health was conferred on Dr. David Littlejohn, Charleston, by the University of Georgia at its commencement, June 2, for his thesis on "Rural Health Needs and How Best Supplied" and in recognition of his work in the field of public health.

Society News.—"Traumatic Surgery: Its Relation to Industry" was the subject of Dr. Clint W. Stallard before the Fayette County Medical Society, May 13, at Montgomery.—— Dr. William S. Middleton, Madison, Wis., addressed the Ohio County Medical Society, May 2, on "Industrial Diseases of the Lung."—— Dr. Martin L. Bonar addressed the Monongalia County Medical Society, May 6, at Morgantown on "Treatment of Skin Diseases."—— The Marion County Medical Society was addressed at Fairmont in April by Dr. Sobisca S. Hall on "Bronchiectasis," illustrated with roentgenograms; a moving picture was shown on "Benign Hypertrophy of the Prostate."

WISCONSIN

Graduate Course in Internal Medicine.—An extensive graduate medical course in internal medicine will be given, beginning June 23, in Beaver Dam, Beloit, Fond Du Lac, Janesville, Madison and Watertown, in each of which cities one lecture will be given every week. The course will consist of twelve lectures and clinics, and will be given by Drs. Ralph H. Major, professor of medicine, University of Kansas School of Medicine, and John H. Musser, professor of medicine, Tulane University of Louisiana School of Medicine. Further information may be had from the University of Wisconsin Extension Division or the medical extension advisory committee of the state medical society.

Society News.—The Barron - Polk - Washburn - Sawyer-Burnett County Medical Society was addressed, June 3, at Frederic, by Drs. Walter C. Andrews on "Acute Upper Respiratory Infections and Complications"; Jake A. Riegel, St. Croix Falls, "Meckel's Diverticulum and Its Surgical Treatment"; Raymond G. Arveson, "Surgical Notes with Presentation of Cases," and Archibald H. Beard, Minneapolis, "Diabetes Mellitus and Vascular Disease."—— Dr. Ralph K. Ghormley, Rochester, Minn., addressed the Rock County Medical Society, recently, on "Joint Changes Resulting from Disease: Their Significance and Treatment."

GENERAL

National Research Council Receives New Funds.—An appropriation of $22,500 from the Spelman Fund has been given to the National Research Council for continuation of the work of the committee of the division of anthropology and psychology on child development for the two fiscal years, 1930-1931 and 1931-1932. It will be given at the rate of $10,000 a year and includes also $2,500 to cover the quarter from the close of the present fiscal year of the committee on March 31 to the beginning of the regular fiscal year of the council on July 1. The Commonwealth Fund appropriated $18,800 for the support of the work of the joint committee of the divisions of medical sciences and of biology and agriculture on infectious abortion for a three year program of study on this disease. The money will be applied toward the maintenance of a cooperative central laboratory at the Michigan State College of Agriculture and Applied Science for the culture and study of strains of the organism *Brucella*, the cause of the disease.

Medical Bills in Congress.—S. 255, the maternity and infancy bill, was reached on the Senate calendar, June 2, 5 and 6, but consideration of the bill was prevented by Senator Phipps, Colorado, and Senator Reed, Pennsylvania. S. 1812, authorizing the Director of the Census to collect annually statistics relating to crime and to the defective, dependent and delinquent classes, has passed the Senate, with an amendment. S. 1721, directing the retirement of acting assistant surgeons of the U. S. Navy at the age of 64 years, has been reported to the House, with an amendment (Report 1775). H. R. 10662, providing for the hospitalization and medical treatment of transferred members of the Fleet Naval Reserve and the Fleet Marine Corps Reserve in government hospitals, without expense to the reservist, has been reported to the Senate, without amendment (Report 811). H. R. 11143, proposing to establish a bureau of narcotics in the Treasury Department, commonly referred to as the Porter Narcotic bill, was reported to the Senate, June 3, with amendments. The bill passed the Senate, June 5, by unanimous consent, with amendments, one of which requires the Secretary of the Treasury to cooperate with the states in the suppression of the abuse of narcotic drugs. The House has agreed to the Senate amendments and the bill is now before the President for approval.

Dr. Flexner to Head New Foundation.—The New York *Times* of June 8 reported that $5,000,000 had been given by Louis Bamberger, Newark, and his sister, Mrs. Felix Fuld, to establish an educational foundation to be known as the Institute for Advanced Study which will be established at Newark for graduate work and scientific research. It will train advanced students for and beyond the degrees of doctor of philosophy or other professional degrees of equal standing. Abraham Flexner, LL.D., former director of the division of medical education of the General Education Board, will be director of the institute. It will be coeducational and will accept all races and creeds that meet its qualifications. It is planned to augment the initial endowment from time to time to provide for such expansion as might become necessary. For the present no medical department will be operated. The trustees are Dr. Flexner; Frank Aydelotte, president of Swarthmore College; Edgar S. Bamberger, Newark, nephew of the founders; Dr. Alexis Carrel of the Rockefeller Institute; Dr. Julius Friedenwald, Baltimore; Alanson B. Houghton, former ambassador to Great Britain; Herbert H. Lehman, lieutenant governor of New York; Dr. Florence R. Sabin of the Rockefeller Institute; Percy S. Straus, New York, and Dr. Lewis H. Weed, dean of Johns Hopkins University School of Medicine.

CANADA

Society News.—The eleventh Congress of the French Speaking Medical Practitioners of North America will be held at the Windsor Hotel, Montreal, September 16-19. Further information may be obtained from Dr. Donatien Marion, P. O. Box 58, Station G, Montreal.

Personal.—A portrait of Dr. Augusta Stowe Gullen was recently presented to her by the medical alumni of the University of Toronto; Dr. Gullen in turn presented it to the Academy of Medicine of Toronto. She is said to have been the first woman to graduate in medicine from a Canadian university.——Dr. Nathan B. Eddy has resigned as associate professor of physiology and pharmacology at the University of Alberta Faculty of Medicine, Edmonton, to become associate professor of pharmacology at the University of Michigan.

PHILIPPINE ISLANDS

University News.—The Rockefeller Foundation has given $150,000 to the University of the Philippines to construct a building to house the university's graduate school of hygiene and public health. A condition that the university provide a suitable site and an annual budget of $40,000 has been met. The University of the Philippines is owned and operated by the state.

LATIN AMERICA

Society News.—The Medical Association of the Isthmian Canal Zone was addressed, April 15, at the Gorgas Hospital, Ancon, C. Z., by Drs. Max R. Stockton and George C. H. Franklin on "Antivenin Therapeusis in Purpura," and Dr. Donald C. Snyder on "Gonorrheal Ophthalmia: Its Incidence in Gorgas Hospital; Diagnosis; Treatment."

CORRECTION

Plasmodium Vivax.—In an editorial in THE JOURNAL, May 31, entitled, "Production of Therapeutic Fever by Short Radio Waves," reference was made to the production of fever in patients with dementia paralytica by the use of *Plasmodium malariae*. Dr. Marcos Fernan-Nunez writes to point out that the term should be *Plasmodium vivax*.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 17, 1930.

The Men of the Last Ice Age in Europe

Lecturing at the Royal College of Surgeons, Sir Arthur Keith described the pioneers of the white race who took possession of Europe during the last phase of glaciation and displaced Neanderthal man, until then in sole possession. The increasing severity of climatic conditions in the opening phase of the ice age may have pushed Neanderthal man toward extinction but would not account for his complete disappearance, for many men of that race lived in Spain, southern France and Italy beyond the arctic conditions. A glance at the forerunners of the man of today explains why Neanderthal man disappeared. The discoveries in the caves of central and southern France revealed the tall, big-headed, strong Cromagnon people. Recently Moravia had begun to rival France in contributions to knowledge of the early white or Caucasian settlers. In the middle or cold and dry phase of the ice age, parts of Moravia became covered by loess, a fine earth which drifted over the open camps of the mammoth hunters, burying their hearths, refuse heaps, utensils and weapons, which were thus preserved. In the loess at Predmost, Professor Maska discovered a tomb of the mammoth hunters containing twenty people. The brains of the mammoth hunters, even when measured by modern standards for Europeans, were large and richly convoluted. The Predomostians, like the Cromagnons of southern France, were big-headed and muscular but of shorter stature. By following Europeans through the third stage of the last ice age by means of dated burials it has been found that in the rigors of the last phase tallness disappeared, but the people remained stout and big-headed. They lived under such conditions as the modern Eskimo, and their jaws and certain portions of their skull took on an Eskimo form, but they showed the essential marks of the Caucasian. Later, when modern climatic conditions were dawning, from 10,000 to 12,000 years ago, European physique became reduced. There were no tall people, and big heads and strong jaws became uncommon. The people became small with slender bones, but whether they were the degenerate descendants of the great pioneers or were new invaders could not be stated. It was just when glacial conditions were giving way to more temperate times that knowledge of our ancestors was most deficient.

The Ross Institute

The Ross Institute and Hospital for Tropical Diseases was founded to investigate problems connected with tropical and other diseases, including cancer, to advise on malaria prevention, and to conduct antimalarial campaigns. The director-in-chief is Sir Ronald Ross; the director of tropical hygiene, Sir William Simpson; the director of tropical medicine and dermatology, Sir William Aldo Castellani; the principal for malaria prophylaxis, Sir Malcolm Watson. The annual report shows that in 1929 Castellani continued his researches on fungi and fungous diseases and Dr. Mackenzie Wallace worked on the effect of the growth of intestinal bacteria on carbohydrates and allied substances. The new malaria laboratory is now complete and well equipped. Two courses of instruction in tropical hygiene for planters have been held, and physicians either from or proceeding to the tropics have used the laboratory to study both the entomologic and the practical sides of malaria control. The industrial antimalarial advisory committee of the institute was formed in July, 1929, and has since met quarterly to consider problems relating to the economic control of the disease in the tropical industries and to promote antimalarial work in different parts of the world. On the committee are represented industries in India, Ceylon, Rhodesia, Malaya, Java, Borneo and Sumatra, and representatives of Africa and of British interests in South America are to be enlisted. A malaria expedition toured India in 1928-1929. In some places, antimalaria work was started during the visit; in others, arrangements were made for preliminary scientific work. Industrial companies which have reaped benefit from cooperation with medical science are increasingly supporting the institute.

Neonatal Deaths

The medical research council has published a study of 800 cases of death within twenty-eight days of birth, made in Glasgow by Dr. J. D. Cruickshank. It has previously been shown that the first week of life is the most dangerous, and in this series 71 per cent of deaths occurred in this period. Of the remainder, 18 per cent occurred in the second week, 8 per cent in the third and 3 per cent in the fourth. But, as Yandell Henderson has shown, the first quarter of an hour after birth is the most dangerous period of life. Its mortality is as great as that of any subsequent month. The two main groups of causes of death in the new-born are injuries or disturbances due to delivery and infection. A third small group is represented by developmental defects and a fourth by thrombosis or hemorrhage associated with maternal toxemia. In 540 cases of the series (67.5 per cent), death was due to conditions associated with delivery—asphyxia livida neonatorum, asphyxia pallida neonatorum, congenital atelectasis, prematurity or birth injury. Asphyxia neonatorum is an exaggeration of the asphyxial congestion present in some degree in all infants at birth; asphyxia pallida neonatorum is a state of shock and is often associated with some birth injury, of which intracranial injury is the most important. Premature birth was a potent factor in neonatal death by accentuating the effects of asphyxia and atelectasis and also by predisposing to sepsis. In 238 cases (29.7 per cent) the cause of death was some infection acquired before, during or after delivery. The common portals of entry were the skin and the respiratory and gastro-intestinal tracts, the umbilical stump only rarely being one. Congenital syphilis was found in only 1 per cent of the cases.

As to prevention, Dr. Cruickshank advocates increased facilities for antenatal examination and treatment at clinics and hospitals and a much greater number of beds for obstetric cases; improved medical education; improved hygiene and housing conditions; special clinics for cases of maternal syphilis, and the application of physiologic methods to the study of the newborn and their diseases. In the treatment of asphyxia neonatorum he emphasizes the avoidance of violent methods of resuscitation and recommends absolute rest and warmth and the use of oxygen with 5 per cent of carbon dioxide. Asphyxia pallida should not be confused with asphyxia livida and should be treated like surgical shock, for the predominant element is shock and failure of circulation due to injury.

Limitation of the Production of Narcotic Drugs

The advisory committee on traffic in opium and other dangerous drugs has submitted to the council of the League of Nations a plan for estimating the world's legitimate requirements of narcotic drugs and for approximating world production to these requirements and apportioning the amounts to be manufactured and supplied by the various producing countries. It is proposed that each country should furnish annually to a central authority an estimate of its requirements for medical and scientific purposes and that production be limited to this estimate. The calculations would be based on the legitimate consumption at the present time, but each country is to be allowed to budget for a margin of supplies to cover possible fluctuations, provided the amount is stated separately. In addition, facilities will be given for establishing reserve stocks, but the central authority will have the power to intervene if the estimates appear excessive. A pooling arrangement is to be made by manufacturing

countries, to each of which will be apportioned the amount it is to contribute. This scheme aims at controlling traffic in narcotics at its source and facilitating the domestic supervision of each country.

Congress for Sex Research

The second International Congress for Sex Research will be held in London at the House of the British Medical Association, August 3-9. General meetings will be held in the mornings at which problems of present interest will be reviewed by prominent workers. The afternoons will be devoted to discussions on the general papers and section meetings. Among the subjects to be discussed at the general meetings are puberty and maturity, problems of the physiology of the generative organs, and hormone therapy. Membership in the congress is restricted to persons engaged in teaching or research in biology, psychology and allied sciences, and to physicians. Those who wish to attend the congress should apply to the congress secretary, Department of Animal Genetics, King's Buildings, the University, Edinburgh.

PARIS

(From Our Regular Correspondent)

May 7, 1930.

The Surplus of Physicians in France

The increasing number of physicians in France, out of proportion to the population, has been observed for a long time. The surplus has become so great that the Confédération des syndicats médicaux has decided to sound a cry of alarm. It has sent a circular letter to teachers and to parents of pupils of the senior classes in the colleges; that is to say, to the young men who are about to complete their school courses and decide on their life work. The letter notes the disappointments that await them if they decide to take up the study of medicine. The reports of the faculties of medicine indicate that the number of physicians has doubled within eight years. The Faculté de médecine de Paris, which formerly admitted fewer than 500 new students each year, is now admitting a thousand. The number of physicians in France has increased from 16,815 in 1900 to 27,500 in 1928, whereas the population has increased only by 2,000,000 inhabitants. Within five years, the number of physicians probably will have increased in like proportions if nothing is done to check present developments. The letter states that the surplus of physicians presents grave dangers for the medical profession and it emphasizes the need of making known these facts to the public. The expense involved in the studies necessary to prepare for the practice of medicine amount to 110,000 francs ($4,400). The present financial rewards of the established physician are much lower than those offered by any of the other professions. His income is diminished still further by the taxes and charges of all kinds with which he is burdened. Without emphasizing unduly the financial argument, toward which the public might show itself indifferent, the letter brings out that the difficulties that the young physician encounters in establishing himself are sometimes evil counselors and may cause him to abandon the ethics that is the safeguard of the dignity and the morality of the profession. The surplus of physicians exerts a highly demoralizing influence in the midst of the difficulties of existence for the intellectual professions over against the rapid accumulation of wealth by promoters of commercial enterprises, who have not borne the brunt of long and difficult preliminary studies. Hence come failures among young physicians who find the struggle too great. The result is that some of them throw themselves into some questionable form of mercantilism. In order to work against the surplus of physicians, one can advise the university authorities to be more severe in the examinations of students, so that the medical profession may again become truly an élite social body, recruited with great care. Unfortunately, however, when the professors show what the students regard as too great severity, the latter revolt and become guilty of riotous or even revolutionary conduct, as was recently witnessed in Paris. The authorities, instead of manifesting the necessary firmness on such occasions, are all too prone to yield to these threats. For instance, Professor Blanchetière, against whom, because of alleged severity in examinations, recent riotous manifestations were directed, has been given a new chair and transferred to the new Faculté de médecine de Marseille. This yielding to pressure brought by the students is not calculated to change their state of mind or to contribute toward the solution of one of the gravest features of the surplus of physicians.

Gift from John D. Rockefeller, Jr., to the Cité Universitaire

Following a study tour of the United States undertaken by M. André Honnorat and M. Jean Branet, and after examining a general report that they presented to him, Mr. John D. Rockefeller, Jr., presented to the Cité universitaire de Paris, under date of July 17, 1928, a gift of $2,000,000 for the construction of the building destined to offer to the students of its various foundations a common dormitory, with restaurants, library, rooms for physical culture, lecture halls, banquet halls and conference halls. A detailed study of the plans of the building brought out, however, that, to carry out the program drawn up by M. Honnorat and M. Branet, the gift, large as it was, would be insufficient. Mr. Rockefeller therefore invited M. André Honnorat to come to New York in company with M. Lucien Bechmann, the architect of the Cité universitaire. As a result of his conversations with them and with his counselors, Mr. Rockefeller decided to increase his gift, donating three and a half million dollars in place of two million.

ITALY

(From Our Regular Correspondent)

Rome, April 15, 1930.

Regulations Concerning Physical Therapy

To prevent certain unfortunate conditions that have been observed in connection with the use of physical therapy and irradiation by persons who lack technical training, the minister of the interior has assumed the duty of revising the laws that govern physical therapy in offices, institutes and ambulatoriums. The regulations that will be issued require a written statement regarding possession of the radiologic apparatus required for therapeutic purposes and, in addition, describe the precautions that must be used for the safety of the patients and the assistants. Persons wishing to practice physical therapy must show that they possess the special training needed. Special regulations will govern the keeping and storing of radioactive substances and will serve to guarantee the value or capacity of protective devices.

Cerebral Development and Physical Education

In the Great Hall of the Università adriatica at Bari, Professor Gallerani inaugurated recently a series of lectures on the development of the brain in relation to physical training. The benefit to cerebral activity resulting from physical training is due to the stimulation that exercise exerts on the hematopoietic organs, which in turn aids the circulation, internal respiration and nutrition of the brain. Well regulated muscular work activates the cardiac function, increases the vital respiratory capacity and the quantity of fixed oxygen, and produces sensory excitations that stimulate the cortical centers. The functional correlation between the glands of internal secretion, particularly between the thyroid, the hypophysis and the genital glands, which have considerable influence on the brain and the mind, is favored by systematic physical exercise. The speaker illustrated the relations between physical education and mental

development, the will and the character in general. The knowledge of one's own strength, the rapid sizing up of the situation, the evaluation of one's opponent—of his intentions, are all mental phenomena stimulated and accentuated by physical exercise. Attention, the indispensable condition for the accomplishment of any cerebral associative act, tends to be perfected by systematic gymnastic exercises, games and fencing. The more developed the power of attention becomes, the shorter will be the reaction time of psychologic, discriminative and selective phenomena.

Aid for Illegitimate Children

During the past year, the Opera nazionale per la protezione della maternità e dell'infanzia has expended 20,000,000 lire ($1,000,000) for the aid and placement of illegitimate children, and about $50,000 for the ambulant chairs of puericulture. The government, recognizing the need of this beneficent institution, has agreed to add 35,000,000 lire ($1,750,000) to the budget of the society, giving it thus the entire proceeds of the tax on bachelors, which was instituted for the express purpose of devoting the amount received to the aid of suffering and abandoned children.

The inspectors of the society have pointed out that in many aid societies a health service is lacking, while in some gouttes de lait and in the Istituto di maternità the health service has been entrusted to persons selected without a competitive contest. Hence, a commissioner of the society has ordered that every institute that admits children must have a physician who, in addition to caring for the sick, should watch over the health of the whole body, including the diet and the clothing of the persons admitted, controlling also the hours to be spent at various tasks, the distribution of mental work, and the results of physical education, making special provisions with regard to weakly and abnormal children. In institutes having an essentially prophylactic and curative scope, the physician will be aided by one or more women assistants who have had training in hygiene pertaining to mothers and children.

Hygienic and Sanitary Problems

The senate discussed recently the sanitary policy of the government, and inquired into the principal problems of hygiene and public welfare. Professor Maragliano spoke on the protection of the people against infectious diseases. Antityphoid vaccination has been, for three years, obligatory for certain classes of citizens who, owing to the nature of their occupation, are more exposed to typhoid infection. At present, antidiphtheritic vaccination is in course of application among the pupils of the primary schools, and the government is considering the question of compulsory vaccination against tuberculosis.

Much has been done in the crusade against tuberculosis, but the speaker recommends also the adoption of direct measures against tuberculous disease during the period of latency, as is being done in other countries. The best propagandists in this crusade are the health officers, to whom the necessary funds for carrying on the campaign should be furnished.

Senator Guaccero explained the aims of the Opera nazionale per la protezione della maternità e infanzia, among which are the training of the mothers, the application of preventive eugenics, and a corrective task consisting in the treatment of the physical and mental defects of children. The speaker advocated greater development of preventive measures, with a supervision of pregnancy from the beginning and compulsory notification of pregnancy. Guaccero illustrated also the importance of the work among cripples, not only from the purely physical point of view but also because of the repercussive moral and psychologic effects that are produced on patients, especially if affected with paralysis. There is need of increasing the number of the orthopedic institutes, the present number having proved inadequate.

De Capitani spoke about the public welfare institutions. The grave question of the hospitalization of patients without adequate means has been solved in the province of Milan, where the Cassa di risparmio (savings bank) has contributed 68,000,000 lire ($3,570,000) for that purpose. Consequently, Milan today has large modern hospitals, well organized and equipped. The speaker expressed the wish that the needs might be met in like manner in other regions of Italy. He urged that research on the subject of compulsory health insurance, especially with reference to the working classes, be again taken up.

Undersecretary of the Interior Arpinati responded, speaking of the work of his ministry in the field of hygiene and public health. He supported the proposal of the health officers that antituberculosis vaccination be introduced in Italy. The government was, he stated, engaged in enlisting a sanitary personnel that would be entrusted with special duties in the crusade against tuberculosis and had already issued orders in the matter. It does not, however, regard as practical the proposal to make notification of pregnancy compulsory, since in that case it would be necessary to fix a penalty for transgression of the law. If the penalty were light, it would be ineffective, and if severe, it would lead to the commission of crimes. A better method would be to furnish aid to the mother during pregnancy whenever she requires it.

Prize Offered for Original Work

The Lega italiana per la lotta contro il cancro has opened an international competitive contest for an unpublished original work, of an experimental and critical nature, on the subject "The Value of Serologic Methods in the Diagnosis of Malignant Tumors." The prize award will be 15,000 lire ($750).

Summer Camps for Children

The organization of summer camps for children has been ordered changed so as to reserve this aid for children who are actually in need. The period of treatment should not be less than forty days. To assist the greatest number of children in need of heliotherapy; sunshine camps will be organized, also outings for boys, extending over short periods. When local conditions warrant, permanent or semipermanent colonies, lasting from May until October, will be created.

The Diet of the Nursing Child

At the recent Pediatric Congress, communications pertaining to the diet of the nursing child were presented. Professor Bentivoglio, of the Clinica pediatrica di Roma, gave an account of a new method of artificial feeding. Through his studies on the physicochemical colloidal properties of milk, the author alleges to have discovered that the addition of a protective colloid to cow's milk favors its digestion and facilitates the utilization of the casein, reducing or eliminating intestinal putrefaction. This method makes it possible to make use, in the first months, of milk that is less diluted than that commonly used, which has a favorable influence on the growth of the child and its bone development.

Professor Giuffrè of Rome spoke on the physicochemical constants of milk in relation to the addition of protective colloids. He studied these constants in cow's milk, after having confirmed the results of the research on the subject by Bentivoglio. Particular interest attaches to the hydrogen ion concentration and ionic dissociation.

Dr. Dazzi of Parma spoke on the vitamin B content of cow's milk, as bought on the market, which he studied in experiments carried out with pigeons. He used crude milk, pasteurized milk or milk brought to the boiling point, taking account also of the season and of the nature of the cows' feed. Dr. Dazzi reached the conclusion that the cow's milk ordinarily purchased on the market contains only a small quantity of vitamin B. Boiling, even if prolonged, does not destroy this vitamin but effects an increase proportionate to the con-

centration of the milk itself. In spring and summer the milk contains a quantity of vitamin B higher than during other seasons, which is probably related to the feed, which in spring and summer is chiefly fresh forage.

Dr. Garzia of Lodi pointed out that, when a child that is breast-fed develops eczema, the milk contains a supernormal percentage of fatty and protein substances. The cryoscopic value exceeds 0.55. The relation of nitrogen to salts is greater than 2:1; the proportion of fats to the protein substances is around 1.80:1, and the relation of fats to salts is less than 25:1.

Prof. Cesare Cocchi of the Clinica pediatrica in Florence reported a number of researches that he had carried out on the intimate composition of the casein and of the lactalbumin contained respectively in human milk, cow's milk and sheep's milk. The amount of cystine (an amino-acid indispensable for growth) does not differ sensibly in the casein and in the lactalbumin of the various animal species. The author was able to confirm by his experiments that casein is poor in cystine, while lactalbumin contains a considerable quantity.

Trachoma in the Schools

It appears that the highest percentage of trachoma among school children is at present in the city of Bari. An inquiry in October, 1928, revealed 1,528 trachoma cases among the 12,679 children, or an incidence of 12 per cent. There has been a slight increase of patients since 1927, when the incidence among the pupils was 11 per cent. During the school year, 952 cases of trachoma and 749 cases of chronic conjunctivitis were encountered. The inspection was scrupulously carried out in all the schools by special personnel attached to the Clinica oculistica of the Università dell'Adriatico. The antitrachoma society of Bari, created in 1913 with the institution of four special classes for trachomatous pupils and two ambulatoriums, comprises at present eighteen special classes and seven ambulatoriums. During the year 1928-1929, 1,067 pupils were treated in these ambulatoriums, as a result of which treatment 256 were cured and 167 were notably benefited.

RIO DE JANEIRO

(From Our Regular Correspondent)

May 15, 1930.

Early Syphilitic Hemiplegia

Drs. Gilberto Moura Costa and Waldemiro Pires of the Gaffrée-Guinle Foundation recently published an article on early syphilitic hemiplegia. Hemiplegia occurs frequently in syphilis. Fournier believes that hemiplegia as a rule appears between the sixth and the tenth years from the onset of syphilis. Among 213 patients with vascular syphilis of the nervous system seen by the authors, hemiplegia developed between the fifth and the twelfth years after the primary chancre. Hemiplegia may be either an early or a late manifestation of syphilis. In a case reported by Jakob, hemiplegia developed fifty years after the chancre, and in some cases it appears after the first year. In the clinic of neurosyphilis of the Gaffrée-Guinle Foundation, the authors observed fourteen cases of early hemiplegia, in nine of which hemiplegia appeared one year after the development of the chancre, in three cases five months after, and in two cases six and eight months, respectively, after the chancre. The authors referred to the following cases which appeared in the literature: Menstrier's patient, aged 26, presented a syphilitic chancre and two months later he was hemiplegic. Serazy's patient, aged 43, a month after the appearance of chancre presented a psoriasiform syphilid which was followed by hemiplegia and death. Necropsy in this case showed an arteritis caused by thrombosis, and microscopic examination revealed the presence of spirochetes. Brult also reported a case of arteritis which developed eight months after the onset of syphilis. When syphilis attacks a cerebral artery, it may cause either a general inflammation in all the coats of the artery (panarteritis) or a local inflammation in some coats of the artery, which condition is considered as endarteritis by Heubner, as periarteritis by Lanceraux and Baumgarten, and as mesarteritis by Köster.

Hemiplegia is a manifestation of syphilitic arteritis. Syphilis in all stages has a tendency to attack the blood vessels, an affinity that is most evident among young syphilitic patients. Pierre Marie says that "any patient who develops organic hemiplegia before the age of 50 is either a cardiac or a syphilitic patient." This is true in early hemiplegia, for among fourteen patients observed by the authors thirteen were under 33 years of age and only one was 50 years old. Hemiplegia may develop either suddenly or following such symptoms as headache, paresthesia, dizziness, insomnia, mental disturbances characterized by irritability, physical wearing and mental torpor. These prodromes, however, are not characteristic of syphilitic hemiplegia because they may be caused by some other cerebral diseases. The occurrence of hemorrhage is uncommon at the onset of syphilitic hemiplegia. Indeed, some authors consider the lack of apoplexy in the primary stage as a characteristic of syphilitic hemiplegia. There exists nonsyphilitic hemiplegia without apoplexy, and syphilitic hemiplegia with grave apoplexy. But in early syphilitic hemiplegia, apoplexy is uncommon. Among the fourteen cases of the authors, six had a sudden attack without becoming unconscious and in the remaining eight hemiplegia was preceded by headache and paresthesia. All patients of early hemiplegia observed by the authors had exaggerated tendon reflexes. The cutaneous reflexes had disappeared in eight patients and were diminished in six. In ten cases, Babinski's sign was present in the hemiplegic side. Hemiplegia was of the Millard-Gubler type in twelve cases, of the Weber type in one case and of the Avelis type in another patient. Ten patients had anarthria which disappeared six or eight days later. Nonsyphilitic hemiplegia begins with the occurrence of a hemorrhage. Syphilitic hemiplegia is less grave than nonsyphilitic hemiplegia because, as a rule, it is not preceded by hemorrhage. It is due to atheromatous lesions.

Examination of the blood and of the cerebrospinal fluid is of great importance in the diagnosis of syphilitic hemiplegia. In five of these fourteen patients, the Wassermann test was positive both in the cerebrospinal fluid and in the blood, in two it was negative in the cerebrospinal fluid and positive in the blood, and in two it was negative in the blood and positive in the cerebrospinal fluid. The Pandy, Nonne and Weichbrodt reactions for the cerebrospinal fluid agreed with the Wassermann reaction. The colloidal gold test and the mastic test were parallel to the Wassermann both in the blood and in the cerebrospinal fluid. The content of albumin in the blood remained normal in all cases. In two cases the tests in the cerebrospinal fluid and in the blood were negative. Diagnosis of syphilitic hemiplegia is not difficult. As a rule the condition develops among patients who, until the appearance of the hemiplegic symptoms, had considered themselves as being in normal health. Whenever arteriosclerosis and heart and kidney diseases may be excluded, the diagnosis of syphilitic arteritis should be considered. Antisyphilitic treatment does not in all cases of syphilitic hemiplegia yield good results. Malaria therapy gives poor results in syphilis of the blood vessels. After necrosis has taken place in the nervous tissues and these are replaced by neuroglia, with secondary sclerosis, the treatment is useless. Early syphilitic hemiplegia, with some exceptions, appears in patients who did not receive adequate treatment. Among the fourteen cases of the authors, one patient had received the entire treatment with neoarsphenamine and he was receiving bismuth treatment when hemiplegia developed. Those patients received injections of neoarsphenamine and bismuth. Four of them recovered, four were much improved, and in six the treatment

was started too late. These six patients received malaria therapy besides neoarsphenamine and bismuth; four of them had a slight improvement; in the other two, no changes were observed in their condition.

Technic for Drainage of the Sphenoidal Sinus

Dr. J. Souza Mendes presented before the Society of Medicine and Surgery of Rio de Janeiro his technic for the drainage of the sphenoidal sinus. The operation is performed under local anesthesia obtained by touching the nasal fossae with cotton soaked in a 20 per cent solution of cocaine hydrochloride and epinephrine. Long ago the author rejected the use of procaine hydrochloride and epinephrine, which diminish the size of the nasal fossae and cause great mental depression. The first step of the operation is the deviation of the nasal septum, which is done with an apparatus which the author designed. The nasal bone is forced to the opposite side, the mucous membrane of the anterior aspect of the sphenoidal bone is slightly separated and the sphenoidal sinus is transformed into only one cavity by resection of the septum between the sinuses. After this procedure, the nasal septum is replaced in the median line. Postoperative tamponage is not necessary. The author reports three cases in which he obtained good results with this technic. He compared some of the other methods now used with his own.

Bacillemia in Leprosy

Dr. Nelson de Souza Campos reported a case in which, three months after the appearance of the acute manifestations of a tuberculous leprosy, bacilli were present in the lymph nodes and in the blood. This bacillemia developed without any other symptoms excepting a persistent asthenia. The author reports this preliminary to a study on the frequency of bacillemia in leprosy. Of sixty-three patients examined, forty-three, or 68.2 per cent, had bacilli in their blood. In tuberculous forms of leprosy, bacilli were found in the blood in every one of nine cases observed. In the nervous forms of leprosy, bacilli were not found in the blood in any of the six cases observed.

BUCHAREST

(From Our Regular Correspondent)

May 6, 1930.

The New Roumanian Health Bill

The committee under the presidency of State Secretary Moldoveanu has elaborated the final draft of the new health law, which will permit only duly qualified doctors of the medical sciences to practice. Physicians with foreign diplomas have to pass an examination in pharmacology, public hygiene and forensic medicine in the Roumanian language before being licensed. To be denominated a specialist, one must pursue special studies for two years in clinics or university institutions and be examined by a special board of two professors of the respective branch of medicine, and the dean of the medical faculty of Bucharest, Cluj, Jassy or Czernowitz universities. Exceptions are made with those specialists who have practiced their specialty ten years. Without the permission of the ministry of health, no public laboratories can be opened. Candidates desiring to open Wassermann or other kinds of bacteriologic, histologic and food analyzing laboratories must apply to the ministry, submitting documentary evidence of their competence. X-ray and radium laboratories may be opened by specially qualified physicians who pass the examination. The wholesale production of curative serums is the monopoly of the ministry of public health and public works.

It is forbidden to publish medical advice, instruction or therapeutic hints in newspapers, periodicals and by correspondence. In journals in which special medical columns are run, contributed by medical men, medical advice on certain diseases may be given, but without prescriptions. The bill forbids all kinds of advertisements relating to single persons or their doings. Descriptions of new operations or the discussion of new therapeutic methods may be published in lay papers only without the names of the operator and the experimenters. It is forbidden to attribute unreal or miraculous actions to certain new drugs. Forbidden are advertisements in cloaked form and all such publications that are conducive to the disrepute of the medical profession. It is forbidden to discuss sexual problems in lay papers. The bill does not allow physicians to exploit the credulity of people by advertising in newspapers or by broadcasting or spreading through posters or pamphlets that they are in possession of some miraculous drugs.

All hospitals, sanatoriums and other therapeutic institutes are under the control of the ministry of health and public work, which has to form committees for the half yearly supervision of such institutions. Every single person infected with a venereal disease is obliged to have himself treated by competent physicians. The state curative institutes are obliged to treat all such entrants free. Those venereal patients who are prone to infect their fellow men will be interned in state hospitals. The propagation of sexual diseases by a person who did not know about his being infectious (it being a frequent pretext used by unscrupulous people), for instance, in the chronic stages of gonorrhea or the early latent stage of syphilis, is an offense punishable with from three to twelve months' imprisonment. It is forbidden to sell pornographic literature, objects or photographs. Second offenders are punished with imprisonment from one to six months. Soldiers who are infectious when dismissed from military service are kept in until they are healed.

A drug store must be kept by qualified pharmacists only who have had practical experience in pharmaceutic laboratories or drug stores for two years. A pharmacist, whether the proprietor of a pharmacy or the employee of one, is allowed to have one drug store only, and he cannot be at the same time a proprietor and an employee too. Cosmetics, hygienic articles and poisonous chemicals used in agriculture and industry may be sold by duly qualified pharmacists only.

The bill will be passed to the chamber of deputies before the summer vacation, so that it will be sanctioned before July and will go in force immediately.

Drastic Orders Concerning Methyl Alcohol

In view of the frequent poisoning with methyl alcohol, the ministry of public health has issued new enactments as follows: 1. It is strictly forbidden to use methyl alcohol in the manufacture of drinks (liqueurs), toilet preparations, or cosmetic articles for the hair and skin. 2. Those authorized to manufacture methyl alcohol may sell it only to those who have been authorized to buy it. Venders or buyers must register every sale or purchase. 3. All vessels containing methyl alcohol must be labeled poison. 4. Any one manufacturing methyl alcohol without authorization, or redistilling it or selling it secretly is liable to imprisonment from one to three years and a fine of from 30,000 to 200,000 lei ($180 to $1,200). When this law went into force, all drinks and toilet articles prepared with methyl alcohol were subjected to notification and were destroyed.

The New Law on Discrediting

Some weeks ago the Bucharest chamber of deputies sanctioned a law on discrediting. The first medical case in which damages were claimed for discrediting was tried some days ago. The roentgenologist of a provincial hospital sued the management for damages for introducing into the hospital another roentgenologist. The plaintiff was appointed as hospital roentgenologist eight years ago. His duty was to appear in the hospital when called for. His position was complimentary, but he was permitted to demand a fee from paying patients of the hospital. About a year ago the hospital got a new surgeon, who did not respect the appointment of the reg-

ular roentgenologist of the hospital and called his own in case of need. Later the former was not called at all. Thereupon the roentgenologist sued the management of the hospital for damage due to "discrediting." He argued that the public, knowing that he was the duly appointed roentgenologist of the hospital, concluded from the fact that it made use of another roentgenologist that he did not possess the necessary skill and competence, and that as a result his practice was considerably less. The court decided in favor of the plaintiff on the ground that, as the hospital did not give notice to the plaintiff, it recognized the existence of his connection with the hospital as its roentgenologist, and as the successor was not appointed by the management of the hospital, public opinion might have been influenced to the detriment of the plaintiff. The plaintiff was awarded the damages he claimed and the hospital was obliged to replace him in his position (which he did not accept) and to pay all legal costs.

BERLIN

(From Our Regular Correspondent)

May 26, 1930.

Deaths Following Inoculation with B C G Vaccine

On the basis of numerous observations and reports, a number of immunizing inoculations against tuberculosis after the method of the French investigator Calmette have been made in Lübeck. In July, 1929, a culture was obtained from Professor Calmette and was recultivated, at intervals of four weeks, in Lübeck. The inoculations and the preparation of the vaccine emulsions were carried out in Lübeck under the personal supervision of Professor Deyke, phthisiologist and director of the Allgemeines Krankenhaus. According to information given out by the public health service of Lübeck, the cultures for the inoculations were subjected to animal experimentation as a safeguard, before they were given out. A total of 246 children were inoculated. April 26, 1930, one death and four cases of infection among the inoculated infants were reported to the health service of Lübeck, whereupon no further vaccine emulsions were given out. May 14, the health service in Lübeck sent a report of the occurrence to the federal bureau of health. On receipt of this information, the federal bureau of health and the "Robert Koch" Preussisches Institut für Infektionskrankheiten each sent an experienced phthisiologist to Lübeck to make an investigation—respectively, Prof. Bruno Lange and Prof. Ludwig Lange. To date, there have been fifteen deaths and some fifty further cases of infection. As Bruno Lange states in the *Deutsche medizinische Wochenschrift*, May 30, 1930, it is certain that the deaths and the cases of infection have a causal connection with the protective inoculation. Both clinically and pathologico-anatomically, the sick children show the typical picture of ingestion tuberculosis, with generalization of the tuberculous process in the internal organs. The port of entry of the bacilli is doubtless the nasopharynx and the intestinal canal. The infections followed the inoculation frequently after an unusually short incubation period (about four weeks); death ensued for the most part within two months after the inoculation. The illnesses and the deaths not merely developed in the children vaccinated on a certain day or at a certain period but were evenly distributed over almost all the vaccines prepared on different days. Why some of the inoculated infants did not develop disease symptoms may possibly be explained by the assumption that these children did not retain much of the ingested vaccine, or perhaps some were not vaccinated who were reported to have been. In judging the whole matter, the widely divergent individual resistance is to be considered, which, according to observations in animal experimentation, exerts an essential influence on the course of an ingestion infection. Unfortunately, the next few weeks will no doubt bring further cases of infection, with possibly more deaths, as the immunizing inoculation was not discontinued until the end of April and thus far the results of only the inoculations performed in February and March have been reported. The facts thus far established appear to justify the conclusion that already in the vaccine administered, and moreover apparently in virtually all preparations of the culture emulsions used on different vaccination days, virulent tubercle bacilli were present in large quantities. Whether or not it will be possible, by the further laboratory researches, which will presumably extend over several weeks, to explain how the accidents happened, is by no means certain, since the only B C G culture sent to Lübeck by the Pasteur Institute, and likewise the prepared vaccines that were ingested, no longer exist. In medical journals and in the daily press, statements occur constantly to the effect that the B C G culture of Calmette, although greatly attenuated in its virulence, may, under certain conditions, regain its original high virulence. It appears impossible, in the Lübeck cases, that a spontaneous change of the apathogenic form of the B C G vaccine into the pathogenic type should have occurred. As to the immunizing effect of the B C G vaccine, the views in Germany are, to be sure, not as optimistic as those of Calmette and his collaborators. The statistics of Calmette concerning the remote results in children inoculated in France, as likewise most of the statistics from other countries, are so defective that a reliable judgment concerning the protective action of the B C G vaccine cannot be formed. Prof. B. Lange advocates that the preparation of the vaccine and the current control of the B C G cultures be centralized and be carried out only in the larger tuberculosis laboratories that have had adequate experience of their own with the Calmette culture; furthermore, under state supervision. The question of guilt is still unexplained, and, judging from the information thus far available, it is doubtful whether the matter will ever be cleared up. The Pasteur Institute in Paris, at least, refuses to admit that it is in any wise culpable. The federal minister of the interior immediately sent a communication to the governments of the German *länder* (states) urging that the Calmette method of immunization against tuberculosis be discontinued until the events in Lübeck had been completely cleared up. Once before, on a previous occasion (in May, 1927) the federal ministry of the interior, in agreement with the resolutions of the federal health council, had advised a conservative attitude toward the whole matter and had sent out a communication to that effect to the constituent governments. The federal health council adhered, at the time, to the view that first still further experimental tests of all the newer procedures recommended for protective inoculation against tuberculosis were necessary before procedures in which living tubercle bacilli are employed can be tested on man on a large scale.

Rosenow's Address Before the Berlin Medical Society

Dr. E. C. Rosenow of the Mayo Clinic delivered, May 21, an address before a large audience of the Berliner medizinische Gesellschaft, on the subject of "Focal Infection and Selective Localization of Streptococci." Specialists in all branches of medicine were present. The session was held in common with the Gesellschaft für Zahnheilkunde. The address awakened great interest, though the opinions expressed were not universally accepted. The chairman, Professor Goldscheider, called attention to the need of an open mind toward these problems, and in view of the great importance of the researches he urged that they be studied without prejudice.

Foreign Guests of the Emperor William Society

Before a select audience of well known investigators in all branches of scientific medicine and chemistry, two foreign guests, Prof. G. Barger of Edinburgh and Professor Aubel of the Collège de France in Paris, spoke recently in the Harnack Haus, the recently opened reception room and lecture hall of the Kaiser Wilhelm Gesellschaft zur Förderung der Wissenschaften.

Professor Barger's topic was "Thyroxin and the Thyroid Gland." Following an historical survey, he described his pupil's

(Harrington) improved method for obtaining natural thyroxin, the active, iodine-containing principle of the thyroid gland discovered by Kendall in 1914. Through increasing the yield it became possible to ascertain its composition. The speaker then discussed the artificial preparation of thyroxin and the divergent action of its two optical isomers. It is a question whether or not thyroxin is to be regarded as the real hormone of the thyroid gland; it is possible that it is only an active component of the protein of the thyroid gland. Finally, he took up goiter prophylaxis in relation to the distribution of iodine in nature.

Professor Aubel chose as his subject the live theme "The Importance of Oxygen Reduction in Living Cells." By the use of ingenious methods it has proved possible to apply to the processes in living cells the idea of the oxygen reduction potential, a well known term in physical chemistry, and to ascertain what the values for the potential are. It is significant that the value for the aerobic cells in the air is the same as the oxydoreduction value of dextrose, if it, with neutral reaction, is in contact with the air. In like manner, the value of this potential for aerobic cells in a nitrogenous atmosphere is of the same magnitude as for a sugar solution under the same conditions. The speaker explained the importance of a knowledge of the oxydoreduction potentials for cell physiology in general.

The Schaudinn Ceremonies

In commemoration of the twenty-fifth anniversary of the discovery of the spirochete that is the causative agent of syphilis, memorial exercises in honor of the discoverer, Dr. Fritz Schaudinn, were held, May 17, 1930, in the Zoologisches Institut, Berlin. At the same time, his workshop or laboratory was dedicated as the "Schaudinn Room." Prof. Max Hartmann and Professor Hesse delivered the memorial addresses.

Stricter Measures Against Psittacosis

In spite of the embargo on the importation of parrots, new cases of psittacosis, some of which resulted fatally, developed, whereupon the Hamburg public health service ordered 140 parrots that were under quarantine to be destroyed. It was decided that all parrots suspected of being sick and likely to transmit the infection should be killed, since, although the birds appeared healthy, the infection must have been transmitted by some of them. In order to destroy all parasites of the skin and feathers, which might possibly be transmitters of the infection, fumes of sulphuric acid were employed. The bodies of the parrots killed were burned. Even with stricter measures there is no certainty that the epidemic will be stamped out at once, since many birds are smuggled in defiance of the embargo.

BELGIUM

(From Our Regular Correspondent)

May 2, 1930.

Industrial Medicine

The *Bruxelles médical* carries an article by Dr. Paul Sollier in which he points out that the creation of an "industrial medicine," adapted to the needs of the army of industrial workers, is just as much of a necessity as "military medicine," "naval medicine" and "colonial medicine." The "industrial physician," too, should possess the variety of knowledge that industrial medicine requires: general medicine, occupational diseases, occupational accidents and safety measures (legislation, administrative regulations, means of technical prevention), psychotechnics, physiology of labor, industrial hygiene. In other words, the industrial physician must be physician, physiologist, psychologist, psychotechnician and hygienist. He must have, furthermore, clear ideas of laws and regulations (protection, insurance, indemnification for diseases and accidents, disabilities and the like). Finally, he should have (and these qualities are not always so easily found incorporated in one individual) an interest in industrial labor, in the problems to which it gives rise, and in the researches that it requires, and he ought to display a certain taste and some understanding for industrial technic, with which he should be constantly in contact and of which he should take the greatest account, from a practical point of view. Hence, one will see at once the need, as pointed out, of close cooperation between the physician, the psychotechnician in particular, on the one hand, and the industrialist, the engineer and the technician, on the other hand.

It may be asked where one can find persons combining all the aforementioned qualifications. Nowhere, in point of fact. It will be necessary to select likely candidates and to develop these qualities by a suitable course of training. It is difficult to find men of just the type demanded, in view of their necessary adaptation to the special duties that must be assumed. But the questions pertaining to the training of the industrial physician and the instruction in industrial medicine will be brought up in due time and will be readily solved, once the needs shall have been recognized.

Reeducation of the Morally Unbalanced

Mr. Titeca has been elected president of the Société de médecine mentale in Belgium. In keeping with the occasion, he delivered an address on "The Reeducation of the Morally Unbalanced." The person who is morally unbalanced must not be regarded as definitively lost to society until all attempts at reeducation shall have failed. Persons morally unbalanced understand perfectly the distinction between evil and moral goodness, but they lack an equilibrium between their weak aptitudes for the good and their powerful tendencies toward evil. One must question somewhat all information furnished by the family, which sometimes seeks, owing to family pride, to attenuate or conceal the defects of its members, or sometimes exaggerates under the influence of the indignation provoked by some grave act. One must assure oneself, of course, that the person in question is not a mental weakling or a mentally backward subject. One should not assume too hastily the existence of hereditary defects. As for the remedy or remedies, they are in practice often difficult to apply. The best remedy is early treatment based on the triad of discipline, surveillance and punishment. What such persons need is neither an asylum nor a prison. With the first appearance of moral disorders, the psychiatrist should be allowed to place his patient in an open service that affords the opportunity of early treatment and the application of therapeutic penalties.

The patient is put to bed and his clothing is removed from the room. He must accept the discipline that is imposed on the group undergoing similar treatment. All calls except those of the family physician are prohibited for several weeks. The patient realizes that, while he is deprived of his liberty, it is purely for medical reasons. The period of confinement to the bed having been completed, the patient passes to the reeducation treatment proper. With extreme prudence, the physician authorizes the progressive use of certain liberties. This reeducation is gradually extended until the patient has been progressively but completely reintroduced to a normal social life. Even after the patient has been set at liberty, he must still visit, from time to time, his physician, who should have become his friend and counselor.

Intercommunal Psychiatric Institute in Brussels

The contract for the construction of the new psychiatric institute to be located in the suburbs of Brussels has been awarded. The new institution will have 116 beds and will have the advantages of the general, surgical and medical services of the Brugmann Hospital. The building will consist of two pavilions. One will be reserved for persons affected with slight or transitory mental disorders; they will be admitted and treated as ordinary patients. The second pavilion will be devoted exclusively to mental patients who may be dangerous to themselves or to others; these will be kept under restraint.

Marriages

ALBERT ROBINS FEINBERG, Wilkes-Barre, Pa., to Miss Madeline Schas of Asheville, N. C., in New Haven, Conn., May 15.

FIELDING OTIS LEWIS, Philadelphia, to Miss Sedric Whittemore Williams of Cambridge, Mass., June 3.

HENRY P. WAGENER, Rochester, Minn., to Miss Sabina Waterfield of Fort Wayne, Ind., May 7.

HENRY MIRON TRACY, Philadelphia, to Miss Katharine E. Whelen of Charlottesville, Va., April 5.

EDWARD P. CONDON to Miss Genevieve Peyton, both of Spokane, Wash., April 23.

FREDERICK C. DRENNING, Duluth, Minn., to Miss Ethel B. Nelson, May 17.

LEO W. HORNICK, Johnstown, Pa., to Miss Nora Bloom, February 5.

Deaths

William Colby Rucker ⊕ surgeon, U. S. Public Health Service and medical officer in charge of the U. S. Marine Hospital, New Orleans, where he died, May 22, of streptococcus infection of the leg. Dr. Rucker was born in Kenney, Ill., in September, 1875. He was educated at the University of North Dakota, the University of Minnesota, and Rush Medical College, Chicago, where he graduated in 1897. In 1902, Dr. Rucker was appointed an assistant surgeon in the U. S. Public Health Service. He became a surgeon in 1918 and was assistant surgeon general from 1912 to 1918. He served in the yellow fever campaign in New Orleans in 1905, in the plague campaign in San Francisco, 1907-1910, and was in charge of the plague eradication campaign in New Orleans in 1914. He was Chairman of the Section on Public Health and Preventive Medicine of the American Medical Association in 1915-1916, and was awarded the Enno Sander Gold Medal in 1908 by the Association of Military Surgeons. Dr. Rucker was a member of the American College of Surgeons, the American College of Physicians and a charter member of the National Board of Medical Examiners. He was secretary of the committee on hygiene and sanitation of the general medical board of the Council of National Defense in 1917, and was detailed with the American Expeditionary Forces during the World War. He was chief medical adviser to the bureau of war risk insurance in Washington, D. C., 1919-1920, and chief quarantine officer in the Panama Canal Zone, 1920-1924. He made sanitary surveys in several central and South American countries and wrote many original articles on the epidemiology of communicable diseases.

Christopher Clark Collins ⊕ Colonel, M. C., U. S. Army; University of Virginia Department of Medicine, Charlottesville, 1895; entered the Army as an assistant surgeon in 1899 and rose through the various grades to that of colonel in 1918; served during the Spanish-American and World wars; member of the American College of Surgeons; aged 58; died suddenly, May 11, of heart disease at the home of relatives in Lynchburg, Va.

Wellington Prude McAdory ⊕ La Grande, Ore.; University of Virginia Department of Medicine, Charlottesville, 1897; member of the Southern Surgical Association and the American College of Surgeons; formerly professor of physiology, Birmingham (Ala.) Medical College; councilor of the third district of the Oregon State Medical Society; on the staff of the Grande Ronde Hospital; aged 55; died, April 18, of heart disease.

Wolff Freudenthal ⊕ New York; University of Freiburg, Germany, 1884; member of the American Academy of Ophthalmology and Oto-Laryngology, the American Laryngological, Rhinological and Otological Society and the American Bronchoscopic Society; on the staffs of the Montefiore Hospital, St. Mark's Hospital, Stuyvesant Hospital, Polyclinic Hospital and Beth Israel Hospital; aged 71; died, May 5, of pneumonia.

George Otis Ward, Worcester, Mass.; Harvard University Medical School, Boston, 1887; member of the Massachusetts Medical Society; past president, secretary, treasurer and councilor of the Worcester District Medical Society; at one time on the staffs of the Worcester City Hospital and the Memorial Hospital; aged 75; died, April 22, in Brighton, of cerebral hemorrhage.

Donald Brock Holloway, Washington, D. C.; Maryland Medical College, Baltimore, 1900; Hahnemann Medical College and Hospital of Philadelphia, 1901; formerly medical examiner in the U. S. Veterans' Bureau; aged 57; died in May at Shawnee, Okla., of perforated duodenal ulcer and uremia.

George Frank Jones ⊕ Georgetown, Del.; University of Maryland School of Medicine, Baltimore, 1889; past president of the Medical Society of Delaware; formerly member of the state board of medical examiners; aged 65; died, April 26, in the Beebe Hospital, Lewes, of heart disease.

Frank A. Helwig ⊕ Akron, N. Y.; University of Buffalo School of Medicine, 1896; health officer of the consolidated district of the village of Akron and the town of Newstead, Erie County, since 1912; past president of the board of education; aged 61; died, April 5.

Levy De Foe Whitaker, Greenville, Ky.; University of Louisville School of Medicine, 1907; member of the Kentucky State Medical Association; health officer of Muhlenberg County; aged 54; died, May 10, of carcinoma of the thyroid gland.

Delbert Leroy Wood, Kansas City, Mo.; Medico-Chirurgical College of Kansas City, 1904; member of the Missouri State Medical Association; aged 68; died, May 14, in the Simpson-Major Sanitarium, of chronic endocarditis.

Charles Willis Kinney ⊕ Flushing, N. Y.; Eclectic Medical Institute, Cincinnati, 1884; formerly on the staffs of the Manhattan Eye, Ear and Throat Hospital and the Staten Island Hospital, New York; aged 68; died, May 20.

Clinton H. Read, Trenton, N. J.; Medico-Chirurgical College of Philadelphia, 1893; member of the Medical Society of New Jersey; formerly member of the state legislature; aged 66; died suddenly, May 9, of heart disease.

James Andrew Ketcherside ⊕ Yuma, Ariz.; Medical Department, University of Tennessee, Nashville, 1893; formerly superintendent of the State Hospital, Phoenix; aged 55; died, February 18, of angina pectoris.

William Ira Butler, Unadilla, Ga.; University of Georgia Medical Department, Augusta, 1905; member of the school board; aged 52; died, May 12, in the Oglethorpe Infirmary, Macon, of heart disease and nephritis.

Willard Abram Putnam ⊕ Cambridge, Mass.; Harvard University Medical School, Boston, 1894; on the staff of the Cambridge City Hospital; aged 64; died in May of septicemia, contracted while caring for a patient.

Leedom Sharp, Intercourse, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1895; member of the Medical Society of the State of Pennsylvania; aged 70; died, April 10, of cerebral arteriosclerosis.

James Monroe Head, Zebulon, Ga.; University of Georgia Medical Department, Augusta, 1877; member of the Medical Association of Georgia; for many years a druggist; aged 77; died, April 9, of chronic nephritis.

James Harvey Peterman, Cherry Tree, Pa.; Baltimore Medical College, 1895; member of the Medical Society of the State of Pennsylvania; aged 60; died, March 15, of acute myocarditis and chronic myocarditis.

Mary Hancock McLean ⊕ St. Louis; University of Michigan Medical School, Ann Arbor, 1883; member of the American College of Surgeons; aged 69; died, May 7, of chronic myocarditis and pyelonephritis.

Samuel Hall Kimmons, Tulsa, Okla.; University of Texas School of Medicine, Galveston, 1898; member of the Oklahoma State Medical Association; aged 63; died, March 25, in a local hospital, of heart disease.

Joseph Emery Reed ⊕ Hubbard, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1906; aged 55; died, May 2, in a hospital at Iowa Falls, of injuries received in an automobile accident.

Victor J. Koch ⊕ Nazareth, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1903; on the staff of the Northampton County Almshouse; aged 53; died, May 7, of heart disease.

Curtis L. Fox, Kingsville, Ohio; Medical Department of Western Reserve University, Cleveland, 1881; member of the Ohio State Medical Association; aged 71; died, May 20, of heart disease.

David S. Booth ⊕ St. Louis; St. Louis Medical College, 1886; on the staff of the St. Louis Baptist Hospital; aged 67; was instantly killed, May 16, when he fell from a fourth floor window.

Ashton Bryant Heyl ⊕ Cincinnati; University of Pennsylvania School of Medicine, Philadelphia, 1888; aged 65; died, May 17, of diabetes mellitus and carcinoma of the bladder.

Joseph Louis Gariss ⊕ Trenton, N. J.; Medico-Chirurgical College of Philadelphia, 1914; on the staff of the Mercer Hospital, where he died, April 29, of acute uremia and chronic nephritis.

Ward M. Beckwith, Oakland, Calif.; Medical Department of Columbia College, New York, 1889; member of the California Medical Association; aged 72; died, January 15.

Maxence B. Herman, Memphis, Tenn.; Missouri Medical College, St. Louis, 1890; aged 77; died, May 9, in the Gartly-Ramsay Hospital, of carcinoma of the bladder and uremia.

Leroy Napier, Lumber City, Ga.; Atlanta College of Physicians and Surgeons, 1898; member of the Medical Association of Georgia; aged 61; died, May 5, of angina pectoris.

Edward Schmiedeknecht, Jr. ⊕ Louisville, Ky.; University of Louisville School of Medicine, 1909; aged 48; died, May 10, in the Kentucky Baptist Hospital, of agranulocytosis.

Thomas B. Herbert ⊕ Lebanon, Mo.; Missouri Medical College, St. Louis, 1890; also a druggist; aged 62; died, May 4, in St. Joseph's Hospital, Springfield, of heart disease.

Calvin P. Thomas, Brewer, Maine; Dartmouth Medical School, Hanover, N. H., 1876; member of the Maine Medical Association; aged 79; died in March at Ormond.

Edward B. Long ⊕ Evansville, Ind.; Louisville (Ky.) Medical College, 1903; on the staff of St. Mary's Hospital; aged 54; died, May 22, of cirrhosis of the liver.

Walter Lindsay ⊕ Huntington, N. Y.; Medical Department of Columbia College, New York, 1866; Civil War veteran; aged 91; died, May 7, of coronary thrombosis.

George Smith Hobbie, Buffalo; University of Buffalo School of Medicine, 1892; aged 70; died, May 7, in the Buffalo General Hospital, of carcinoma of the prostate.

Julian F. Ward, Winchester, Va.; University of Virginia Department of Medicine, Charlottesville, 1877; aged 78; died, March 31, of myocarditis and chronic nephritis.

James Ephriam Smedley ⊕ Chicago; University of Michigan Medical School, Ann Arbor, 1890; aged 74; died, May 17, of diabetes mellitus and arteriosclerosis.

Edgar James Martin, Columbus, Ohio; Medical College of Ohio, Cincinnati, 1889; aged 61; died, May 19, in St. Francis Hospital, of heart disease.

Edwin Elmer Sowles, Mason City, Iowa; College of Physicians and Surgeons, Keokuk, 1888; aged 74; died, May 4, of chronic valvular heart disease.

Donald P. McLachlan, Milan, Mich.; Cincinnati College of Medicine and Surgery, 1876; aged 81; died, May 7, in Durant, of diabetes mellitus.

Edward Dwight Rigby, Almond, Wis.; Milwaukee Medical College, 1902; veteran of the Spanish-American war; aged 65; died, May 6, of sinusitis.

David Vincent Runyan, Sturgis, Mich.; Indiana Medical College, Indianapolis, 1877; aged 81; died, March 27, at the Memorial Hospital.

James N. Christian, Alma, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; aged 57; died, March 12, of pneumonia.

Ryerson G. Healey, Bitely, Mich.; Rush Medical College, Chicago, 1875; aged 79; died, May 13, in Bay City, of cerebral hemorrhage.

Evan C. Kennedy, New Glasgow, N. S.; Boston University School of Medicine, 1876; aged 77; died in March of cerebral hemorrhage.

William John Anderson, Jasper, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1894; aged 66; died, March 27.

George Hoover Thacher, Philadelphia; Hahnemann Medical College of Philadelphia, 1892; aged 62; died, May 20, of pyemia.

Nestor Barnett, Caneyville, Ky.; Kentucky School of Medicine, Louisville, 1889; aged 73; died, May 2, of heart disease.

Ralph D. Eastman ⊕ Berkshire, N. Y.; University of Buffalo School of Medicine, 1878; aged 81; died, March 5.

John Roy Hawkins, Miami, Fla.; Atlanta College of Physicians and Surgeons, 1913; aged 43; died, March 13.

Franklin Pitman Batchelder, Sapulpa, Okla.; Rush Medical College, Chicago, 1881; aged 73; died, in March.

William C. Whitman, Pasadena, Calif.; Missouri Medical College, St. Louis, 1884; aged 68; died in March.

Orin Stanley Welty, Dover, Ohio; Bellevue Hospital Medical College, New York, 1878; aged 78; died, April 23.

Bureau of Investigation

"FLAXOLYN"

"What Price Testimonials?"

Under the title given above, the National Better Business Bureau has recently issued a bulletin to periodical publishers that contains information that is of interest to physicians and should be of value to the general public. Before dealing with the National Better Business Bureau's report, it may be well to state that Flaxolyn purports to be the "discovery" of one H. H. Luntz. Most of the advertising today gives Luntz's name as "Harris H. Luntz, M.D., D.O." A few years ago, however, he seemed to be "Harry Luntz, M.D., D.O., D.C." We are unable to find any record of a man by the name of Harris H. Luntz ever being graduated from a reputable medical school or licensed to practice medicine in any state in the Union.

One Harry Luntz was granted a diploma by the College of Medicine and Surgery, Physio-Medical, Chicago, in 1911.

957 W. 18th Street, Chicago, Ill.

My Dear Dr. Luntz:

Kindly find enclosed endorsement of the merits of your FLAXOLYN. It has been clinically and therapeutically tested and we find it corresponding to your claim.

I have taken two ounces of it myself and some of our students of the College of Medicine and Surgery have also taken it and they say it is the most normal laxative that science can compound.

We permit you to use these names for any good purpose that will benefit FLAXOLYN, I am,

Cordially yours,

WILLIAM F. SCHAARE, M. D.

At the time of this letter Dr. Schaare was Professor of Surgery in the Chicago College of Medicine and Surgery. He enclosed with it the signed endorsement of 53 well-known physicians of Chicago, including among others, Dr. N. La Doit Johnson, formerly president of the College of Medicine and Surgery, Chicago, Ill., and Dr. Chas. J. Lewis and Dr. H. A. Hadley, formerly registrar and dean respectively of the same institution.

Here is a photographic reproduction of one testimonial that was not dealt with in the National Better Business Bureau's report. The testimonial of William F. Schaare, M.D., has been featured by Luntz for some years. Note, also, the name of Dr. N. La Doit Johnson as another testimonial giver for Flaxolyn. The diploma issued to Harry Luntz in 1911 by the College of Medicine and Surgery (Physio-Medical), was signed William F. Schaare, M.D., Secretary, and N. La Doit Johnson, M.D., President. Other faculty signatures on the same diploma included the names of Drs. Charles J. Lewis and H. A. Hadley.

There is no record, however, that Harry Luntz has ever been licensed to practice medicine anywhere. Some years ago the Biographical Department of the American Medical Association sent Harry Luntz the usual blank questionnaire, and in answer to the question, "Practice limited to? . . ." Luntz answered, "Taking subscriptions for literary magazines!" Luntz is also credited—if it be a credit—with having been graduated by the American College of Osteopathy, the Old Physio-Medical College, and the Philadelphia College of Osteopathy.

Harry Luntz, who in some of his earlier advertisements is described as a "well-known Alsatian physician" and "a leader among the drugless practitioners of the country," claims to have been born in 1878. He introduced his Flaxolyn in 1911—at least some 1921 advertisements state that Flaxolyn was "first introduced by Dr. Luntz in this country ten years ago." In various advertisements he has also claimed that he "spent twenty years developing the Flaxolyn formula." This means

that he started developing Flaxolyn in 1891—when he was thirteen years old!

For some time Flaxolyn was a mixture of powdered herbs. Luntz has always made a pretense of giving the composition of Flaxolyn. The files of the Bureau of Investigation show that the alleged formulas have varied with the years, and in no instance have quantities been given. Today, Flaxolyn comes in two forms—powdered and liquid. The advertisements of the powdered form have always stressed the fact that it contains no alcohol or narcotics:

"It contains absolutely no alcohol, no iron, no narcotic. Alcohol and narcotics stimulate. You may feel better temporarily. But there is a let-down. The after-effects are to be feared."

The liquid Flaxolyn that is now on the market contains 10 per cent of alcohol—more than the average amount of alcohol found in champagne! During the past year Flaxolyn has been heavily advertised, mainly by the testimonial method. One of the chief testimonials and one that is featured on the trade package of the powdered Flaxolyn is that of Quack George Starr White of Los Angeles.

Coming back to the report of the National Better Business Bureau, that organization declares it has information that indicates, first, that some of the testimonials were purchased at prices ranging from $10 to $850, second, that in some cases the testimonial givers declared the publication was unauthorized, and third, that many of the so-called doctors who gave the testimonials were not licensed physicians at all. The investigators called on a large number of the Flaxolyn testimonial givers residing in eastern cities and represented themselves as agents for "Mentho-Mulsion." There is no such a product, the name being created by the investigators for the purpose of asking the Flaxolyn testimonial givers whether or not they would testify for Mentho-Mulsion, and if so, what they would charge.

The report of the National Better Business Bureau then gives in some detail the results of the investigation, dealing individually with many testimonial givers. While the report is too voluminous for this article, we will as briefly as possible give the gist of some of the cases described:

Thomas A. Wallace, New York City.—This man is among those whose picture and testimonial has appeared in the Flaxolyn advertising. The investigator who called on Wallace found him with a Dr. Hausman, who did most of the talking for Wallace. He is reported to have said that Wallace endorsed Flaxolyn because he had used it and after examining the purported formula of "Mentho-Mulsion," stated that Dr. Wallace would endorse that product also. Hausman is said to have suggested that Dr. Wallace ought to get a good suit of clothes and a hat out of his testimonial and remarked, "Dr. Wallace wears very good clothes." The Bureau reported that it seemed that the sum of $100 would be acceptable.

E. J. Herman, Philadelphia.—This man is also a Flaxolyn testimonial giver. It was reported that Herman was unwilling to endorse "Mentho-Mulsion," stating, "The fee I got from Flaxolyn did not begin to pay for the sacrifice I had to make." He is said to have told the investigator that he did not even write the testimonial that was used.

E. J. Leyrer, Philadelphia.—This person has been credited with acclaiming the Flaxolyn formula as the best he knew for keeping physically fit. He is said to have told the investigator that what he received from the Flaxolyn people did not make up for the patients he lost as a "drugless physician."

R. A. Stippich, Philadelphia.—This man, who is reported to have endorsed Flaxolyn, is said to have admitted that he received $50 for doing it. He refused to endorse "Mentho-Mulsion," stating that the Flaxolyn testimonial had cost him many patients.

Thomas E. Eldridge, Philadelphia.—According to the testimonial credited to this man, "No other medicine in all my years as a physician ever equalled Flaxolyn." He is said to have told the investigator that he received $850 from the Flaxolyn people. He also is said to have declared that he gives radio talks on products which he has endorsed, and to have agreed to endorse "Mentho-Mulsion" for $300.

Arthur W. Shultz, Philadelphia.—One Flaxolyn advertisement reads: "Dr. Shultz Says There Is Nothing Better and More Natural Than Flaxolyn for Rundown Condition." The Bureau reports, however, that the investigator was told by Arthur W. Shultz that his name had been used without his consent.

Katherine Griswold.—This chiropractor has been quoted as recommending Flaxolyn. She is said to have stated to the investigator that she gave the testimonial purely as an accommodation. Although the testimonial states that she has used it herself, she told the investigator that she had never tested it.

James Forquer.—This man is quoted in Flaxolyn testimonials as stating: "Mother Nature Herself Endows Flaxolyn With Its Health Powers." He is alleged to have admitted to the investigator that he expected to get $10 as a remuneration for his testimonial but he had never received it.

A. W. Herr.—This man is said to have admitted that he received from $75 to $100 for his testimonial.

David W. Johnson.—This chiropractor is said to have stated that he received about $50 for his Flaxolyn testimonial and to have agreed to endorse "Mentho-Mulsion" for $75.

Margaret Nesbit.—This osteopath, who "Heartily Praises Flaxolyn for Stomach and Bowels," is said to have stated that she was to get a $10 credit on a $21 set of books for her testimonial, but that she had seen neither the $10 nor the set of books.

H. V. Walls, Pittsburgh.—This dentist, according to the Bureau's report, agreed to endorse "Mentho-Mulsion" for $400 but declined to do so for $250, stating that Flaxolyn had paid him considerably more.

Charles Leslie Lewis, Pittsburgh.—This osteopath, according to the report, admitted that he got $50 for his Flaxolyn testimonial, and agreed to endorse "Mentho-Mulsion" for the same amount. He is also said to have admitted that he gave his endorsement without receiving any of the medicine or reading the formula.

Carl Victor, Pittsburgh.—This "naturopath" was not seen by the investigator, but his wife, who was interviewed, is said to have stated that Victor would not endorse another medicine for less than a thousand dollars, since he had received far too little for his Flaxolyn testimonial. Victor, it was stated, was formerly in a partnership which operated as the "Victor-Barth Health Institute."

William A. Good, Pittsburgh.—This man, who is director of the "Pittsburgh Lyceum Health Institute" and had been described as a "doctor" in the Flaxolyn testimonial, appears to have formerly been a vaudeville acrobat. The report states that Good admitted that he received $100 for endorsing Flaxolyn, which he did without seeing either the formula or the product.

C. J. Kreller.—This man, listed as a chiropractor, has had his picture published in the Flaxolyn advertising under the heading, "Pittsburgh Doctor's Message to New Englanders." He is alleged to have agreed to endorse "Mentho-Mulsion" for $100.

This is not the complete list of the individuals dealt with in the National Better Business Bureau's report on Flaxolyn, but it is sufficient. Some of the testimonial givers the investigators could not find; others were too far afield to warrant the expense necessary to interview them. The Bureau's publication, however, is a valuable piece of work. To those newspaper publishers who cynically take the attitude that one expects testimonials to be purchased and that if the public can be fooled by such tricks as these, so much the worse for the public, the Bureau's report will probably carry little weight. To those other publishers who have some regard for the decencies of their craft, the report surely furnishes sufficient evidence to warrant the total rejection of Harris H. Luntz's Flaxolyn advertising.

Correspondence

THE SALT-POOR DIET IN HYPERTENSION

To the Editor:—I followed for some time with great interest the controversy on the value of a salt-poor diet in the treatment of hypertension. I have used a salt-free diet in fifty-seven cases of arterial hypertension. Of these fifty-seven patients, in whom renal injury was excluded by careful functional tests, forty-seven (73.6 per cent) have shown improvement to varying degrees. Five (8.5 per cent) have held a normal blood pressure for at least three years, and the others have blood pressures below 160 systolic and around 100 diastolic. Twelve did not react at all. Later on, one developed a renal lesion and died of apoplexy. The others I lost sight of. In two of these cases, a striking example was furnished of how even a slight increase in the salt content may offset, or entirely obviate, response to salt-poor diet.

One patient was a woman who showed a hypertension of the postmenopausal type and in whom no renal injury could be demonstrated. She showed no response to salt-poor diet after a week of observation. On careful questioning, it was found that she was using as drinking water the water from the bathroom faucet, which here happens to be mineral water. The substitution of spring water resulted within forty-eight hours in a drop of 30 points systolic and 20 points diastolic.

In another case, I referred a patient to a physician for blood pressure readings, who added to his diet one quart of milk a day. He promptly responded with a rise in his pressure to its former level. When he resumed a salt-poor diet, his blood pressure returned to normal and has been so for over a year, but he responds at once with a rise if he is forced to eat out or be away from his diet for only a short time.

It is quite obvious that this measure is not efficacious in every case of hypertension. One can roughly distinguish two large groups, one of which does, and the other does not, respond to salt restrictions. The latter, in my experience, usually develops later on a renal injury. In any case in which renal damage is present, I found that a salt-free diet has little or no permanent effect on the blood pressure, in disagreement with Dr. Allen's observations.

I find that a certain group of patients responds to salt restriction with large (usually 10 Gm. or above) amounts of sodium chloride in the urine, the excretion comes only gradually down to the level of the intake, and the balance between intake and output does not establish itself until a week or later from the assumption of the diet. This type answers with a prompt drop in blood pressure, which runs almost proportionate to the excreted amount of salt.

The other type responds only with a comparatively low incipient excretion of salt (usually 5 Gm. or less) and falls quickly to the balance between intake and output. This type responds only slightly, or not at all, to salt restriction. Evidently, we are dealing with a different type of binding of sodium chloride in the tissues, the latter type probably corresponding to Widal's dry chlor retention.

Another striking thing is that, as far as I can see from the literature and personal observation, the salt-free diet seems to be giving better results in the hands of Dr. Allen and his pupils than in those of other observers.

F. S. MODERN, M.D., Arrowhead Springs, Calif.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

INHALATORS FOR RESUSCITATION

To the Editor:—In THE JOURNAL, January 18, is an editorial on carbon monoxide poisoning, which includes the report of the committee on various poisonous gases. The JOURNAL speaks of the attachment in the treatment of gas poisonings known as inhalators. A percentage of oxygen and a percentage of carbon dioxide are mentioned to be used in combating the lethal effects of this carbon monoxide and other poisonous gases. My purpose is to obtain information in general relevant to the management of any such case as well as to obtain the address of the manufacturer who puts out this inhalator for the use mentioned. It is our purpose to equip this institution with all approved appliances for treatment of any emergency that may arrive. Would an ordinary gas mask that is used with our oxygen apparatus suffice for this specific purpose?

TAMPA MUNICIPAL HOSPITAL, Tampa, Fla.

ANSWER.—The H-H Inhalator referred to in the report and the editorial on carbon monoxide poisoning is an apparatus invented by Drs. Yandell Henderson and H. W. Haggard. It is manufactured and sold by the Mine Safety Appliances Company, Braddock Avenue and Thomas Boulevard, Pittsburgh. It is now the standard equipment for the rescue crews of city fire and police departments, city gas companies and other chemical industries. In some features it resembles the anesthetic apparatus with which ethylene, nitrous oxide and ether with oxygen are administered in hospitals. For safe carriage on the ambulance it is made in portable form packed in a suit case. For its particular purpose, it has the advantage that, by means of a needle valve graduated to read in liters per minute, the amount of the mixture of oxygen and carbon dioxide administered to the patient can be adjusted to his breathing or to any desired flow. In this respect it is much more convenient and economical in the use of gas than is the ordinary oxygen or anesthetic apparatus. A slight modification of the apparatus, called the "physicians' type" H-H Inhalator, packed in a smaller case, from which it can be removed, is now being developed especially for use in the prolonged inhalation of oxygen and carbon dioxide administered to pneumonia patients.

The Davis Inhalator, manufactured by the Davis Emergency Equipment Company, now Bullard-Davis, Inc., 506 South Wabash Avenue, Chicago, is a device which can be used for administering oxygen and mixtures of oxygen and carbon dioxide.

SPAYING OF FEMALE DOG

To the Editor:—Kindly outline the technic and operative steps involved in the spaying of a female dog. How old must the dog be before this procedure can be successfully performed? Please omit name.

M.D., Utah.

ANSWER.—Strictly aseptic technic is employed.

1. The operation is performed under general ether anesthesia.
2. The operative field is cleansed and shaved as a preliminary preparation to sterilization.
3. The operative field is sterilized with mercurochrome or some other good disinfectant.
4. The sterile field is delineated with sterile laparotomy sheets.
5. The distance from the umbilicus to the vagina is blocked off in thirds. The incision is extended the entire length of the middle third and is made through the abdominal wall one-fourth inch to the left of the linea alba, thus exposing the pelvic viscera. Each horn of the uterus is picked up separately and followed cephalad to the ovary, which lies embedded in a pad of fat close to the dorsal pelvic wall. The ovaries are easily and surely located by following the uterine horns. The fat part is opened carefully; all vessels to the ovary and other small bleeders are ligated. The ovaries are clipped out, care being taken that there is no bleeding into the pelvic cavity.
6. The abdominal wall is sewed up in separate layers: (*a*) The peritoneum is closed. (*b*) The abdominal wall is closed. (*c*) The subcutaneous tissue is closed. (*d*) About four anchor stitches are put through the skin with heavy linen thread. The line of incision is sponged with mercurochrome and a bandage is applied.

This operation has been performed successfully on dogs six weeks after birth and no doubt could be done earlier.

TREATMENT OF NEUROSYPHILIS

To the Editor:—In Queries and Minor Notes (THE JOURNAL, January 18), under the heading "Treatment of Neurosyphilis," the use of arsphenamine is recommended. In a case of twenty years' standing, with symptoms of neurosyphilis appearing about eight months ago, in which intensive arsphenamine treatment was used about two years after the patient was first infected, and in which the treatment in question has been said by a fairly eminent physician to be contraindicated on account of danger from its use causing insanity, would you suggest that this advice be ignored and the treatment given as suggested in the article or not? Negative blood and spinal fluid Wassermann and Kahn reactions were recently obtained, but the report indicates a positive gold curve; yet evidence of neurosyphilis remains. I am administering treatment as outlined in your article and wish to know whether there is any danger in the use of the arsphenamine in such a case. If you suggest its use, after it is given in the blood stream should it later on be used in the spine also? Before I read the article, six injections of tryparsamide were administered; the patient's eyes were affected and the treatment was discontinued. I wish to supplement my letter by stating that the patient I am treating has been suffering for several weeks with a queer swimming sensation in his head and some unsteadiness when he attempts to stand still. Before these sensations appeared he had some peculiar sensations in his right hand and foot, not very severe, and he was put on a treatment of sodium cacodylate for eight or ten weeks and then took six treatments of tryparsamide at five day intervals. During these treatments the swimming in his head appeared and he also had some trouble with his vision. What I wish to know is, Do you think that the arsenical treatment is causing his head to swim, or is it the disease, and should I push the treatment or let him rest a while?

M.D., Kentucky.

ANSWER.—It is suggested that the treatment be used as indicated in the article quoted. The use of arsphenamine should not be stopped because of a possibility of causing insanity. Arsphenamine should not be given intraspinally except as a last resort. Spinal drainage may be used with some success simultaneous with intravenous arsphenamine. The question does not indicate what type of neurosyphilis the patient is suffering from. If the patient has tabes, the directions in the article may be followed. But if he has paralytic dementia, a fever therapy should be considered. It is quite possible that the patient has a meningovascular syphilis. But it is impossible to say definitely since the positive observations have not been stated. The age of the patient is not given, so that one cannot state that a cerebral nonsyphilitic vascular disease is not present. It does not seem likely that the arsphenamine causes the vertigo, but one should be rather cautious in proceeding with that drug since it may often do harm in syphilitic vascular diseases.

BOVINE GERM MAY CAUSE UNDULANT FEVER

To the Editor:—When I sit down to read THE JOURNAL I view it with much respect—with a feeling akin to reverence, because I have been taught to believe that its contents represent the investigations and experiences of some of the best brains of the medical profession where many brave men have sacrificed much, even their lives, on account of their altruistic motives. In the issue of Dec. 21, 1929, is quite a lengthy article on the subject of undulant fever, all of which dovetails well with all the information I have been able to obtain on the subject and has given me a feeling of security in using and selling my milk; but now comes one Dr. Damrau, I believe of New York, who seems to take a decided and opposite stand to the views and experiences of many physicians as expressed in THE JOURNAL. He claims that the bovine germ is entirely harmless to man and saddles all the blame of undulant fever on goats and pigs. (See his article in the February issue of *Good Housekeeping.*) Here is where the shoe pinches in my case: I have a nice herd of milk goats and have been using their milk for years, have raised some of my children on it and have sold it to hundreds or others. The goats have never aborted nor have they ever been on pasture that has been tramped over by cattle. Neither I nor any one else has been able to trace the origin of any disease to this milk. It has been recommended by specialists in this vicinity. Yet since reading Dr. Damrau's article I could not help but feel at least some doubt on the subject and I therefore come to you for advice, feeling assured that no one is in better position than you to advise in this matter. Would you advise me to get rid of my goats and use cow's milk? C. A. WEIRICH, North Canton, Ohio.

ANSWER.—It has been conclusively demonstrated that *Brucella melitensis* variety *abortus* of bovine origin is capable of producing undulant fever in susceptible human beings. *Brucella melitensis* infections originating from the ingestion of infected goat's milk have occurred chiefly in Texas, Arizona and New Mexico. The great majority of recently reported cases of undulant fever have occurred in non-goat-raising areas. A large number of cases have occurred among raw milk consumers in cities where there has been no direct contact with goats or hogs. The agglutination test is of value in determining the presence of *Brucella* infection in goats as well as in cattle.

FORTIFIED COD LIVER OIL

To the Editor:—I have recently received a physician's sample of Upjohn's fortified cod liver oil. As the label does not state the methods of preparation or standardization, I am wondering whether the product is reliable. Council-accepted products of this nature seem to present their claims clearly. Has Upjohn's product been submitted to the Council? If so, what is its standing? How does it compare with different brands of cod liver oil with viosterol being manufactured under license of the Wisconsin Alumni Research Foundation? Please omit name.

M.D., New York.

ANSWER.—The Upjohn Company markets a product "Super D Brand Cod Liver Oil." The advertising that is issued for this preparation reads as if the product were cod liver oil fortified by the addition of irradiated ergosterol. The Upjohn Company has not requested consideration of its product by the Council on Pharmacy and Chemistry and so far the Council has not reported on the preparation.

The Council on Pharmacy and Chemistry has accepted the following brands of cod liver oil with viosterol 5 D for New and Nonofficial Remedies:

Abbott's Cod Liver Oil with Viosterol 5 D (the Abbott Laboratories).
Parke, Davis & Company's Cod Liver Oil with Viosterol 5 D (Parke, Davis & Co.).
Squibb's Cod Liver Oil with Viosterol 5 D (E. R. Squibb & Sons).
Squibb's Cod Liver Oil with Viosterol 5 D, Mint Flavored (E. R. Squibb & Sons).

DANGERS IN SULPHUR REFINING

To the Editor:—Is there any danger for a man working in sulphur refining works? He has been informed that it will kill him. Is there any literature on the subject? M.D., California.

ANSWER:—Many compounds of sulphur are toxic, notably carbon disulphide and hydrogen sulphide. This toxicity is not shared by sulphur itself, which is relatively innocuous.

The refining processes in the sulphur industry depend on the source of the sulphur. Much sulphur is so pure as mined as to be directly usable for most industrial purposes. A great tonnage of sulphur is derived from the smelting of ores rich in sulphur. In this process many impurities exist and some are toxic, such as arsenic. Gas house hydrogen sulphide is extensively treated to yield sulphur. Greater danger exists in these preliminary steps than in the distillation of sulphur to form flowers of sulphur, roll sulphur, precipitated sulphur, washed sulphur, and the like. Any process involving the use of carbon bisulphide for extraction purposes is hazardous. Two parts of carbon bisulphide vapor per million of air constitutes a hazard. Commonly, sulphur is refined by merely heating to evaporation the crude sulphur, which contains 3 or 4 per cent of earthy impurities. In this process, sulphur dioxide and trioxide are produced. These oxides are irrespirable, chocking and extremely irritating. Their action is immediate, and ample warning is given as to their presence. Sulphurous acid, and quickly thereafter, sulphuric acid is formed on entering the body, so that no direct systemic action of these sulphur oxides is known. Workers around refrigerator plants where sulphur dioxide is the refrigerant are not regarded as engaged in especially hazardous work.

CONCENTRATED FOOD AND GASTRIC DISTRESS

To the Editor:—A feeble woman, aged 72, with arteriosclerotic heart disease and chronic constipation, complains of epigastric distress whenever food of any kind is taken into the stomach. The distress consists primarily of distention of the abdomen. Roentgen examination and gastric analyses are normal. She has taken every imaginable kind of medicine to relieve the condition, but none of them are effective any more. Is there a concentrated, partially digested food on the market and, if so, where can it be obtained?

PAUL K. JENKINS, M.D., Miami Beach, Fla.

ANSWER.—The patient described gives the impression of a rather characteristic complaint. It seems that in all likelihood there is a psychogenic background to this condition, a common occurrence in 72 year old women. She could probably take any medicine and any concentrated food, if there is any, without results. One should get at the "social background" before attempting any further kind of therapy.

PERITONEAL ABSORPTION OF BLOOD—VALUE OF YEAST

To the Editor:—1. In a patient requiring a blood transfusion, will blood (properly typed) injected intraperitoneally be absorbed? If so, will this absorption be rapid enough to restore an acute loss of blood? 2. Is there any fact to the widely advertised claims supported by foreign "medical authorities" that yeast is beneficial in constipation and skin troubles? Please omit name. M.D., Massachusetts.

ANSWER.—1. Blood will be absorbed gradually from the peritoneal cavity, but it is doubtful indeed whether such absorption can restore acute loss of blood quickly enough.

2. Yeast has so uncertain a laxative effect that it is hardly justifiable to class it among the cathartics. It might more appropriately find a place among the laxative diet factors alongside bran, honey and prunes. Its content in the vitamins, temporarily classified under the heading B, makes it of specific value in skin eruptions due to vitamin B deficiency, such as those occurring in pellagra. That it is of much value in other kinds of skin trouble, such as acne or furunculosis, is doubtful, as many patients who keep on suffering from these conditions, in spite of liberal ingestion of yeast, are willing to testify. That among the hosts of persons taking yeast a skin disorder clears up occasionally is not surprising. The association might be entirely accidental. The history of yeast, its periodic waning and gaining in favor, suggests that it has a therapeutic value, but that this value is slight indeed.

NO INTESTINAL ANTISEPTICS

To the Editor:—Is there recognized any drug which, if taken by mouth, constitutes an intestinal antiseptic? If so, is a triple sulphocarbolate such a substance? MERRILL R. FOX, M.D., Payette, Idaho.

ANSWER.—There is really no such thing as an intestinal antiseptic, if that term is defined as equivalent to disinfectant, there being no known influence capable of killing the micro-organisms in the living intestine. If the term is defined to include inhibition of the growth and diminution in the number of intestinal microbes, then diet (milk diet in most adults) would constitute perhaps the most important influence of that kind. Mild mercurous chloride might qualify as an efficient drug with a tendency in this direction. Phenolsulphonates (sulphocarbolates) are worthless.

RICKETS DEVELOPING IN CHILD ON S. M. A.

To the Editor:—I have recommended S. M. A. to a number of my patients; I also put my grandchild on the food when three weeks of age. While he has developed normally in every way—cut his teeth at 6 months, seems strong and sturdy—there seems to be now at 7 months some suspicion of bowlegs. The child has had orange and tomato juice, spinach, and the like, according to directions given with S. M. A. Should the food be discontinued and cow's milk substituted, or does the food contain the proper elements for a child until he is able to eat?

B. G. ANDERSON, M.D., Uhrichsville, Ohio.

ANSWER.—It would seem advisable to give additional antirachitic elements if the child is showing clinical evidence of faulty bone development. Some infants develop evidence of rickets at some time, perhaps slight, even though fed on a diet that is generally considered to contain enough of the antirachitic elements to prevent their occurrence in the average case.

PERIODIC SWELLINGS, OR QUINCKE'S DISEASE

To the Editor:—I am interested in a genuine case of Quincke's disease, affecting a business man, 50 years old. He has a background of a neurotic type plus persistent insomnia. About every three weeks he has an attack; the face swells and he becomes grotesque; there are imprints of the teeth on the tongue but the larynx is not involved. Lately the periodic large swellings are in abeyance but his face is slightly swollen in some part or another practically all the time and sometimes a painful swelling around the ear appears. Within the past three months his wife has developed the same complaint; her face is not so enormously swollen but it is almost continuously noticeably swollen, generally around the eyes and lips, and also the ears. The ear swellings alone are painful. What could you advise? Where does the trouble lie, on the neurosis basis or dietary? Please omit name.

M.D., New Jersey.

ANSWER.—There is always some inherent neurogenic basis for such cases—a constitutional predisposition which is often inherited. Factors that tend to render the autonomic system overactive, such as fatigue, increase this predisposition. There is probably always a sensitization to some foreign protein, usually a food. This should be investigated, by skin tests, or by keeping a diary of the menu day by day, and observing what foods the attacks follow. Calcium salts are worth trying, and may be of benefit.

It is unusual that the wife should have the same symptoms.

TREATMENT OF OPTIC ATROPHY IN LOCOMOTOR ATAXIA

To the Editor:—A well nourished woman, aged 38, has locomotor ataxia with severe gastric crises and considerable optic nerve involvement. The sight is almost gone in one eye. What intravenous preparations are safe to use in this type of case? What is your opinion of malaria inoculation?

M.D., Nebraska.

ANSWER.—When an optic atrophy develops early in a case of tabes dorsalis, treatment is of little value in arresting the progress of the eye condition. The arsenical preparations bear a certain element of danger and it is questionable whether they are more efficacious than the time-honored mercury and iodides. Malaria or any febrile producing foreign protein can be used, but in larger series of cases the end-results have not been any more satisfactory. Injection of mercury into the lateral ventricles has been used, and reports of arrested cases thus treated have appeared.

URINARY RETENTION AND PROSTATIC HYPERTROPHY

To the Editor:—For the past year or so I have had progressive difficulty in urination. When I arise in the morning I am unable to void and not until I have made several attempts at varying intervals can I empty my bladder. The symptoms point to prostatic trouble and as I am 46 years of age, a little younger than the usual age for the appearance of such a condition, I am interested to know whether there is any treatment I can employ to alleviate the symptoms or at least obviate the future necessity of a prostatectomy. My urine contains no albumin, sugar or pus cells. Would the use of contraceptive sheaths over a period of fourteen years be a factor in causing such a condition? Please do not publish my name.

M.D., Illinois.

ANSWER.—In the instance referred to, presence of retention should be determined. The patient, immediately following urination, should be catheterized and the quantity of the urine drawn measured. Discovery of retention points to prostatic enlargement. If this condition is due to congestion, massage will relieve it. The steady use of contraceptive sheaths has been reported as a cause of chronic engorgement of the prostate. The age of the patient rather speaks against true hypertrophy. There is no treatment known that would prevent the development of prostatic hypertrophy or adenoma of this organ.

ARSENIC NEURITIS

To the Editor:—In your opinion or from literature available would you consider that an arsenic neuritis could be produced by constant staining of the hands with the dye from wall paper containing on analysis 0.23 mg. of metallic arsenic per hundred grams, or from the paste containing 0.28 mg. of metallic arsenic per hundred grams? The clinical picture of the double sciatica with unilateral drop foot is similar to that seen following overdosage with solution of potassium arsenite. Your opinion will be greatly appreciated.

T. K. FARNSWORTH, M.D., Birmingham, Ala.

ANSWER.—There are no good reasons to believe that the small traces of arsenic indicated may cause any form of arsenic poisoning. Larger amounts than these may, in fact, be found in articles of wide use, such as in chewing tobacco, wherein $^{27}/_{100}$ grain of arsenic (as arsenic trioxide) per pound have been detected, and in apples $^{25}/_{1.000}$ grain of arsenic per pound of fruit, as permitted under governmental regulations now in force.

This statement does not, however, rule out the possibility of arsenic poisoning in this case. An analysis of one batch (or a few batches) of the suspected materials long after the disease state has developed is somewhat futile. Other lots may have revealed dangerous quantities of arsenicals. Too, the possibility of other sources of arsenic must be considered. Acceptable evidence may be derived from an analysis of the patient's hair obtained by a haircut. Normal persons will present no arsenic or less arsenic than $^1/_{150}$ grain per pound of hair, while persons intoxicated by arsenic will commonly exhibit such quantities as $^1/_{50}$ grain or more for the same unit of hair.

DETERMINATION OF BASAL METABOLISM

To the Editor:—I have under my care several young women on whom I should like to obtain basal metabolic rates, who are affected with severe scoliosis to such an extent as to make it impossible to determine the normal oxygen intake by the usual means. One patient has extension atrophy and distortion resulting from poliomyelitis. Can you suggest some standard for determining the normal other than the height-weight-sex scale ordinarily used in basal metabolism work? Please omit name.

M.D., Iowa.

ANSWER.—It is almost impossible to change the standard of determination of basal metabolism. Dreyer has published (*Lancet* **2**:289 [Aug. 7] 1920) a formula for predicting basal metabolism on the weight and age factors. This certainly is not as accurate as the Aub-Du Bois formula or the Harris-Benedict prediction tables. Of course, the actual body surface could be measured, but this would be an extremely difficult procedure.

POSSIBLE DEATH FROM DRINKING ETHYLENE GLYCOL ("PRESTONE")

To the Editor:—Two young men of our town died from drinking Prestone antifreeze radiator fluid. Death seemed to be caused by respiratory failure and convulsions. They were not seen professionally until twelve hours after drinking the fluid and were then in a stupor; respiration was rapid, the skin was cold, there was some cyanosis, the patients were vomiting, and prostration was extreme. Prestone is not labeled poison. What do you think caused death? What is in the formula of Prestone? Please omit name.

M.D., Nebraska.

ANSWER.—Prestone is ethylene glycol—an excellent antifreeze agent for automobile radiators but a questionable beverage.

Ethylene glycol is related to both ethyl alcohol and glycerin, being intermediate between them:

Ethyl alcohol (A primary alcohol)	Ethylene glycol (A secondary alcohol)	Glycerin (A tertiary alcohol)
$H_2C—H$ $H_2C—OH$	$H_2C—OH$ $H_2C—OH$	$H_2C—OH$ $HC—OH$ $H_2C—OH$

Persons in the stage of imbibing radiator antifreeze mixtures commonly attain to this oasis as a result of previous drinking. Unless the facts as to other imbibitions are clearly known, the case against ethylene glycol remains to be proved.

Ethylene glycol has been hailed as a nontoxic substitute for benzene and other toxic bodies in lacquers and paints. So used, no record exists as to severe injuries attributable to it. Small quantities of fumes from overheated ethylene glycol in the air irritate the eyes and mucous membranes. Nausea has been observed. Rightly employed, ethylene glycol is at this time accepted as essentially harmless. Taken as a beverage, intoxication and death are reasonable expectations.

TESTS OF IMPOTENCE

To the Editor:—A business man, aged 54, of good appearance and good general health except for considerable headache, for which he takes acetanilid compound tablets, had a negative Wassermann test one year ago. He had gonorrhea and chancroids at about age of 28. The genital organs are normal in appearance and he states that his sexual desire is fairly strong and erection is good. Under the microscope the spermatic fluid shows dead, that is, nonmotile, spermatozoa. He wants to know whether this is due to old age; if so, when does it usually occur, or is it due to something else? Should he marry? Could he have children? The woman is 34 years of age. How much longer would he be able to perform the marriage act? Please omit name.

M.D., North Dakota.

ANSWER.—The cause of the functional deficiency of spermatozooa is not always to be determined. In the given instance the previous infections may be held responsible. Examination of the expressed prostatic fluid and a serologic test following a provocative arsenic injection should be employed. Persistence of sexual activity varies according to the individual.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALABAMA: Montgomery, July 8, 1930. Sec., Dr. Stuart Graves, 519 Dexter Ave., Montgomery, Ala.

ARIZONA: Phoenix, July 1-2, 1930. Sec., Dr. H. P. Mills, 14 N. Central Ave., Phoenix, Ariz.

CALIFORNIA: San Francisco, July 7-10, 1930. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento, Calif.

COLORADO: Denver, July 1, 1930. Sec., Dr. Wm. W. Williams, 224 State Capitol Bldg., Denver.

CONNECTICUT: Regular, Hartford, July 8-9, 1930. Sec., Dr. T. P. Murdoch, 79 Elm St., Hartford, Conn. Homeo., New Haven, July 8, 1930. Sec., Dr. E. C. M. Hall, 82 Grand Ave., New Haven, Conn.

DISTRICT OF COLUMBIA: Washington, July 14, 1930. Sec., Dr. W. C. Fowler, District Bldg., Washington, D. C., Basic Science, June 30, 1930.

FLORIDA: Lakeland, June 16-17, 1930. Sec., Dr. Wm. M. Rowlett, P. O. Box 603, Tampa, Fla.

INDIANA: Indianapolis, June 17-20, 1930. Sec., Dr. W. R. Davidson, 413 State House, Indianapolis.

KANSAS: Kansas City, Kan., June 17, 1930. Sec., Dr. Albert S. Ross, Sabetha, Kan.

MAINE: Waterville, July 1-2, 1930. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland, Me.

MARYLAND: Baltimore, June 17-20, 1930. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore, Md. Homeopathic. June 17-18, 1930. Sec., Dr. J. S. Garrison, 517 Old Orchard Road, Baltimore, Md.

MASSACHUSETTS: Boston, July 8-10, 1930. Sec., Dr. Frank M. Vaughan, 144 State House, Boston.

MICHIGAN: Detroit, June 16-18, 1930. Sec., Dr. F. C. Warnshuis, 1010 Maccabee Bldg., Detroit.

MINNESOTA: Minneapolis, June 17-19, 1930. Sec., Dr. E. T. Sanderson, 524 Lowry Bldg., St. Paul.

MISSISSIPPI: Jackson, June 26-27, 1930. Sec., Dr. F. J. Underwood, Jackson, Miss.

NEW JERSEY: Trenton, June 16-17, 1930. Sec., Dr. Charles B. Kelley, 1101 Trenton Trust Bldg., Trenton, N. J.

NEW YORK: Albany, Buffalo, New York, Syracuse, June 23-26, 1930. Chief, Herbert J. Hamilton, Education Bldg., Albany, N. Y.

NORTH CAROLINA: Raleigh, June 16, 1930. Sec., Dr. John W. MacConnell, Davidson, N. C.

NORTH DAKOTA: Grand Forks, June 30 to July 3, 1930. Sec., Dr. G. M. Williamson, Grand Forks, N. D.

OPHTHALMIC BOARD: Detroit, Mich., June 23, 1930. Sec., Dr. William H. Wilder, 122 So. Michigan Ave., Chicago, Ill.

OREGON: Portland, July 1-3, 1930. Sec., Dr. C. J. McCusker, Medical Dental Bldg., Portland, Ore.

OTOLARYNGOLOGY BOARD: Detroit, Mich., June 23, 1930. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Neb.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 8-12, 1930. Supt., Mr. C. D. Koch, Harrisburg, Pa.

RHODE ISLAND: Providence, July 2-3, 1930. Dir., Mr. Lester A. Round, 319 State Office Bldg., Providence, R. I.

SOUTH CAROLINA: Columbia, June 24, 1930. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia, S. C.

SOUTH DAKOTA: Deadwood, July 15, 1930. Dir., Dr. H. R. Kenaston, Bonesteel, S. D.

TEXAS: Austin, June 17-19, 1930. Sec., Dr. T. J. Crowe, 918-919 Mercantile Bank Bldg., Dallas, Texas.

UTAH: Salt Lake City, June 26-27, 1930. Dir., Mr. S. W. Golding, 412 State Capitol Bldg., Salt Lake City, Utah.

VERMONT: Burlington, June 18-20, 1930. Sec., Dr. W. Scott Nay, Underhill, Vt.

VIRGINIA: Richmond, June 17-20, 1930. Sec., Dr. J. W. Preston, 720 Shenandoah Life Bldg., Roanoke, Va.

WASHINGTON: Seattle, July 14-15, 1930. Basic Science. Dir., Mr. Charles Maybury, Olympia, Wash. Regular, Seattle, July 14-15, 1930.

WEST VIRGINIA: Martinsburg, July 8, 1930. Sec., Dr. W. T. Henshaw, Charleston, W. Va.

WISCONSIN: Milwaukee, June 24-26, 1930. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., La Crosse, Wis. Basic Science. Milwaukee, June 23, 1930. Sec., Prof. Robert M. Bauer, Marquette Bldg., Milwaukee.

Minnesota January Examination

Dr. E. T. Sanderson, secretary of the Board of Medical Examiners of Minnesota, reports the oral, written and practical examination held at Minneapolis, Jan. 21-23, 1930. The examination covered 12 subjects and included 60 questions. An average of 75 per cent was required to pass. Thirty-seven candidates were examined and passed. Four candidates were licensed through reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Emory University School of Medicine		(1926)	89.3
Northwestern University Medical School		(1923)	87.2
Rush Medical College		(1927)	89.2, (1929) 92
Harvard University Medical School		(1927)	90.5
Detroit College of Medicine and Surgery		(1927)	91
University of Minnesota Medical School		(1929)	82.6*
	82.6,* 83.1, 83.6,* 85, 85.1,* 85.2, 85.5,* 86.4,* 86.6,* 87.4,* 87.5,* 87.5,* 87.6,* 88,* 88.2,* 88.2,* 88.4,* 88.5, 89, 89.5,* 89.6,* 90.4,* 91.3*		
University of Nebraska College of Medicine		(1928)	91.1
Syracuse University College of Medicine		(1927)	90
University of Buffalo School of Medicine		(1927)	89.4
University of Pennsylvania School of Medicine		(1927)	89.2
University of Texas School of Medicine		(1928)	90.4
University of Alberta Faculty of Medicine		(1926)	88.3
University of Toronto Faculty of Medicine		(1927)	88.6

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
State University of Iowa College of Medicine	(1926)	(1927)	Iowa
St. Louis Univ. School of Med.	(1921)	Missouri, (1924)	Louisiana

* These candidates have received their M.B. degree and will receive their M.D. degree on completion of one year's internship in a hospital.

Maine March Examination

Dr. Adam P. Leighton, Jr., secretary of the Board of Registration in Medicine of Maine, reports the written examination held at Portland, March 11 and 12, 1930. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Four candidates were examined, 3 of whom passed and 1 failed. One physician was licensed through reciprocity with another state and 1 by endorsement of credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Harvard University Medical School		(1928)	84
Tufts College Medical School	(1926) 78,	(1929)	79

College	FAILED	Year Grad.	Per Cent
University of Berlin Faculty of Medicine		(1908)	69.8

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Western Reserve University School of Medicine		(1914)	Ohio

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement of
Cornell University Medical College		(1926)	N. B. M. Ex.

Book Notices

NASAL CATARRH. By W. Stuart-Low, F.R.C.S., Consulting Surgeon to the Central London Throat, Nose and Ear Hospital. Cloth. Price, 5/- net. Pp. 84, with 12 illustrations. London: H. K. Lewis, Ltd., 1930.

In this brochure the term "catarrh" is applied to any type of secretion issuing from the nose whether it is serous, mucoid, mucopurulent or purulent. In the United States the term "catarrh" as a rule designates the flow of an excessive amount of mucoid material, and whenever a mucopurulent or a purulent secretion is present, this condition is usually considered a suppurating one, and usually means involvement of the nasal accessory sinuses. The author's main thesis is that "nasal catarrh, whether acute or chronic, emanates entirely from obstruction to a free passage, and the removal of such obstruction is of the most urgent importance in the treatment." This consists in the corrections of deviations of the nasal septum, removal of markedly hypertrophied portions of the inferior turbinates, cauterization of the intumescent inferior turbinals, and removal of nasal polypi and adenoids. He also wisely warns against indiscriminate and needless destruction of the mucosa-bearing columnar epithelium over the respiratory portion of the nose by excessive cauterization, or by the removal of too much of the inferior turbinated body. It has long been recognized that the destruction of mucosa that has columnar ciliated epithelium is replaced by scar tissue covered by squamous epithelium; and this tissue no longer serves the important function of warming, moistening and filtering the inspired air. Too often the zeal of the operator leads him to remove a large portion if not the entire interior in the effort to obtain a wide passage way, and this in turn leads to drying of the secretions, the forming of crusts and all the disagreeable features of a postoperative atrophic rhinitis. The author takes up the various subjects of nasal polyp, ethmoiditis, hyperesthetic rhinitis, and so on, in the clear and concise manner characteristic of most English writers. While there is nothing new in his conclusions and while this subject in many ways is elementary in character, its perusal will prove of benefit and good counsel especially to the younger men in otolaryngology, whose enthusiam often leads them to unwise and indiscriminate operative procedures.

DIE SÄUGLINGSERNÄHRUNG: EINE ANLEITUNG FÜR ÄRZTE UND STUDIERENDE. Von L. F. Meyer, Professor der Kinderheilkunde, dirigierender Ärzt am Waisenhaus und Kinderasyl der Stadt Berlin, und E. Nassau, leitender Ärzt der Kurstätte für rachitische Kinder der Stadt Berlin. Paper. Price, 25 marks. Pp. 353, with 85 illustrations. Munich: J. F. Bergmann, 1930.

In this monograph on nutrition in infancy, Meyer and Nassau thoroughly review the subject in both its physiologic and its pathologic aspect, stressing the clinical and practical applications. The first part of the work is devoted to a discussion of the physiology of infant nutrition, including such subjects as development, metabolism, artificial feeding, breast feeding, prophylaxis and immunity. There is a special chapter on the care of premature and debilitated infants. The subject of prophylaxis is emphasized, and the authors point to the progressive diminution in infant mortality as an indication of the successful application of preventive measures. They point to the fact that a satisfactory state of nutrition produces an optimal state of immunity against infection. In this connection the authors indicate the significance of vitamins A, B, C and D for proper nutrition and for the maintenance of a natural state of immunity. They assert that the greatest advance in artificial feeding has been the recognition of the fact that not only the rate of gain in weight but also the immunity of the artificially fed infant must be raised to the level of that of the breast-fed infant. Observation of the development of the child as a whole is a better indication of normal nutrition than the color and consistency of the stools. The qualitative composition of the diet, as well as the fact that a generous supply of food is needed, should be considered. The danger of underfeeding and of protracted hunger periods is emphasized. The difficulties in feeding premature and debilitated infants are considered. The chief dangers to these patients are birth trauma and intestinal and nutritional instability during the first four to six weeks of life. From the third to the sixth month premature children are predisposed to malnutrition, rickets and anemias, and show poor resistance against infection.

In the second part of the monograph, the authors discuss the pathology of nutrition in infancy. They consider the characteristic clinical types of disturbed nutrition in the artificially and breast-fed infant, as well as such secondary conditions as rickets, tetany and anemia. In prognosis and treatment, the importance of classifying the nutritional states is emphasized. Eutrophy, dystrophy and atrophy are the three chief nutritional states. Nutritional disturbances in artificially fed infants are classified under four groups: (1) diarrheal disturbances, (2) infection, (3) quantitative or qualitative underfeeding, and (4) abnormal constitution. Under the last group, three types are enumerated: the exudative, the lymphatic and the neuropathic. It is gratifying to note that the authors have come to believe that constitutional factors are not as important as they were formerly thought to be by Germanic authors.

In the treatment of acute dyspepsias, a definite scheme is outlined. It is recommended that the fat content of the diet be diminished and that the amount of albumin be increased. The indications for the use of various mixtures in normal infants are considered in detail. The use of simple milk dilutions, milk mixtures with added albumin, lactic acid milk, and Bessau's rice water mixture, with the addition of albumin milk or buttermilk rich in carbohydrate (from 3 to 10 per cent) are discussed in detail.

The authors present a hypothesis to explain the pathogenesis of alimentary intoxication. Dyspepsia or diarrheal disturbance is followed by damage to the cells of the intestine and liver. These cells undergo functional and organic deterioration, as a result of which they give up their water content. As the condition progresses, the tissues of the body also lose water, with resulting dehydration and intoxication. The important factor in the treatment of intoxication is to combat dehydration. A starvation period of twenty-four hours is recommended at the beginning of the treatment. This is followed by the administration of buttermilk, of a solution of salt and sugar, or of skimmed milk. When the infant has been detoxicated and is in a state of reparation, breast milk, albumin milk or the richer mixtures of buttermilk should be begun.

The pertinent facts concerning avitaminosis are described. American investigators are given credit for the discovery of vitamins A, B, C and D. The vitamin content of the various foodstuffs is quoted from Sherman on the "Chemistry of Food." Attention has been directed recently by Reyher to the clinical importance of vitamin B deficiency in infancy. The cardinal symptoms of this condition are pylorospasm, nervous vomiting and spasmophilia. Other symptoms mentioned are delayed growth and maldevelopment of bones, hair, nails and teeth, as well as edema, hypertrophy and dilatation of the heart. These symptoms, according to Reyher, develop gradually and subside only after a considerable period of vitamin B feeding. However, Meyer and Nassau are of the opinion that the rôle of vitamin B deficiency as the cause of the symptoms named is not definitely settled.

Under the heading of secondary alimentary disturbances, the authors discuss rickets, tetany and anemia. They discuss the pathogenesis of rickets and describe the clinical manifestations of the disease. The modern theories, particularly the theory of acidosis of Freudenberg and György, are discussed. Therapy and prophylaxis are also considered.

Severe types of anemia occur most frequently after the first half year, which is in contrast to the primary nutritional disturbances that occur during the first six months of life. The authors consider four types of anemia in infancy: (1) anemias of premature infants and twins, (2) purely infectious anemias (syphilis, tuberculosis), (3) infectious alimentary anemias, and (4) genuine alimentary anemias. Under the subject of pathogenesis are considered deficiency in iron, weakness of the hematopoietic system, deficiency in the function of the bone marrow or liver, the rôle of bacteria and their toxins, and alimentary injuries. A mixed diet is advocated in the treatment of anemias. As a prophylactic measure, an excessive quantity of milk should be avoided in the diet.

The book contains much useful information and the most recent views on the feeding and nutrition of infants.

TREATMENT BY MANIPULATION: A PRACTICAL HANDBOOK FOR THE PRACTITIONER AND STUDENT. By A. G. Timbrell Fisher, M.C., F.R.C.S., Surgeon (with Charge of Out-Patients), Seamen's (Dreadnought) Hospital, Greenwich. Second edition of "Manipulative Surgery." Cloth. Price, $3.50. Pp. 200, with 62 illustrations. New York: Macmillan Company, 1929.

This book was written with the object of drawing the attention of the medical profession to the importance and value of manipulative treatment in carefully selected cases of certain of the sequelae of injuries and diseases particularly affecting the joints, muscles, tendons and fasciae. The author emphasizes the importance of fundamental knowledge concerning the anatomy, physiology and pathology of the joints. He points out indications and contraindications and the potential dangers of manipulation. He states that it is indicated in cases with adhesions, functional or hysterical cases, unreduced dislocations or subluxations, and a miscellaneous group of conditions. He outlines the general principles for manipulation. He states that in difficult cases it is wise to proceed by carefully planned series of manipulations, rather than to risk exciting severe reaction and shock by attempting too much at one time. The surgeon who performs the manipulation should take a personal interest in the after-care. Fischer advises waiting for a quiet period of the condition, and the avoidance of manipulation unless the general condition of the patient is good. It should be avoided in the elderly and feeble.

Under the diagnosis of intra-articular and periarticular adhesions he gives, as symptoms, limitation of motion, pain, weakness, tenderness and recurrent effusion. He describes in detail the mode of formation of adhesions in a joint. He describes in detail the manipulative technic as performed on various parts of the body, especially the spine, shoulder, elbow, wrist, hip, knee and ankle. In manipulation of a knee for displacement of the internal semilunar cartilage he emphasizes that the test of reduction consists in the fact that the patient can fully extend the knee without pain.

The author discusses the matter of osteopathy and chiropractic. "Osteopathy is a system of treatment emanating from

America. The underlying theory is that all disease is due to interference with the blood supply, and that this interference is caused by pressure on the vasomotor system in the region of the spine. This pressure is said to be due to minor displacements, or 'subluxations,' of vertebrae—the 'osteopathic lesions.' If the theories were harmless, one could safely ignore the cult and allow it to die a natural death, but unfortunately they are in many cases dangerous. Many osteopaths pay little or no attention to diagnosis, and patients with malignant disease or other serious conditions often waste precious time in such treatment, while the condition from which they are suffering is rapidly getting beyond useful medical or surgical intervention." He says it is a melancholy reflection that the law permits such abominable and dangerous practices, and that the medical profession owes it to the public to oppose with the utmost vigor any official recognition of osteopathy. He says that chiropractic is another cult somewhat similar to osteopathy but based on even more unscientific evidence. The chiropractors assume that all diseases and deformities are due to displacements of vertebrae causing pressure on intervertebral nerves, which pressure causes interference with the normal flow of "vital force" from the spine to various parts of the body. A recent definition of chiropractic is: "A system of adjustment, consisting of palpation of the spinal column to ascertain vertebral subluxations, followed by the adjustment of them by hand, in order to relieve pressure upon the nerves at the intervertebral foramina, so that the nerve force may flow freely from the brain to the rest of the body." Unfortunately for this theory, it is anatomically impossible for such pressure to occur without gross dislocations or displacements, which would give rise to paralysis and other serious signs and symptoms.

It is a rule of the greatest importance that in all cases of manipulation, that is, afterward, the joint must be voluntarily moved through the increased range of motion at the earliest possible moment.

LA SIERODIAGNOSI DELLA SIFILIDE: DOTTRINA TECNICA E VALORE PRATICO CON SPECIALE RIGUARDO ALLA CLINICA MEDICA. I. Por Dr. Valentino Facchini, libero docente in clinica medica generale nella Regia Università, Bologna. Paper. Price, 60 lire. Pp. 530. Bologna: L. Cappelli, 1929.

The first part of this volume presents an elaborate discussion of the Wassermann test. It goes into the details of the history and technic of complement fixation, as elaborated by Bordet and Gengou, of the original Wassermann test and of many of its modifications. The Kolmer modification is not mentioned. In summarizing this section, the author says: "Wassermann's technic remains to this day—I shall not say in an honorable position—but still in a dominant position." No mention is made of the Kahn test or any of the advances in the serum diagnosis of syphilis along the lines of precipitation. The remaining part of the volume is devoted to the clinical application of the Wassermann reaction both with serum and with spinal fluid.

A SUMMARY OF CORRELATED FACTS CONCERNING UNDULANT FEVER IN HUMANS AND CONTAGIOUS ABORTION IN ANIMALS AND THE RELATIONSHIP OF ONE TO THE OTHER FROM THE STANDPOINT OF TRANSMISSION THROUGH MEAT AND MILK PRODUCTS. By L. C. Bulmer, B.S., N.D.D., Director, Bureau of Dairy Inspection, Jefferson County Board of Health, Birmingham, Alabama. Second edition. Paper. Price, $1.60. Pp. 66, with 8 illustrations. Birmingham, Alabama: Technical Service Bureau, 1930.

This comprises a correlation of data derived from a careful survey of authoritative medical and veterinarian literature pertaining to undulant fever in human beings and contagious abortion in animals and their etiologic relationship one to the other. The present publication is the outgrowth of a report prepared by Bulmer at the request of J. D. Dowling of the Jefferson County (Ala.) Board of Health; this board has authorized the publication of the report in its present monograph form. The chronological development of the present-day knowledge of the disease in animals and human beings is treated in short, concise paragraphs. Evidence is submitted regarding the widespread distribution of contagious abortion in cattle and the more frequent recognition of *Brucella* infection in human beings in all parts of the United States. The author expresses amazement at the indifference displayed by many physicians, public health workers and veterinarians regarding adequate control of the infection; the author concludes that sufficient confirmed information regarding the relationship of the disease in animals and man has been accumulated during recent years to render unwarranted any further procrastination on the part of public health workers and sanitary live stock officers. The bacteriologic, serologic and clinical considerations are stated briefly and concisely. The illustrations are poor but do not detract from the merits of the text matter. This monograph should enjoy wide distribution among physicians, public health officials and veterinarians.

ANATOMICAL STUDIES OF THE CENTRAL NERVOUS SYSTEM OF DOGS WITHOUT FOREBRAIN OR CEREBELLUM. By L. Raymond Morrison, M.D., Scholar of the Remmert Adriaan Laan-Fonds. Psycho-Neurological Clinic of the University of Utrecht. Paper. Pp. 109, with illustrations. Haarlem: Erven F. Bohn, 1929.

The author made microscopic studies of two dogs operated on by Professor Rademaker, in which in several stages the cerebral cortex, the striatum and the cerebellum were removed. The observations of previous investigators were confirmed and extended. The anatomic and histologic observations are given in great detail and illustrated by photomicrographs.

Medicolegal

Compensation of Expert Witnesses

(Ealy v. Shetler Ice Cream Company (W. Va.), 150 S. E. 539)

The plaintiff, a physician, sued to recover compensation for services rendered by him as an expert witness. A suit had been brought against the defendant on account of injuries inflicted by a truck owned by it, and counsel for the defendant in that case asked the plaintiff in the present action, Ealy, to make a physical examination of the injured boy, with a view to being called as a witness. The physician made the desired examination, consulted with another physician concerning the case and examined a number of roentgenograms, devoting about two hours altogether to the work. Later he appeared in court in response to a summons duly issued. The trial lasted three days, and the physician was on the witness stand a part of one afternoon. He rendered a bill for $250. Payment was refused, and he sued for double that amount. Judgment was rendered in favor of the physician, and the defendant appealed to the Supreme Court of Appeals of West Virginia.

At common law, witnesses were required to attend court without pay, but now, in West Virginia, as in nearly all other states, statutes allow compensation. The compensation is not intended to pay the witness for giving testimony but is rather to make good the loss and expense incurred by him in leaving his home and occupation to attend court. The laws of West Virginia make no provision for special compensation for witnesses called to give expert testimony, in either civil or criminal cases. Every witness must attend as long as commanded to do so and testify as to all material facts within his knowledge. This duty is founded on the basic principle of constitutional government, that the administration of justice is a benefit to all members of a community and that every competent citizen is under an obligation to further it as a matter of public duty, when summoned by due process of law. The Supreme Court of Appeals quoted with approval 40 Cyc. p. 2186:

> Apart from statute, an expert witness may be compelled to testify as to matters of a professional opinion, or matters to which he has gained special knowledge by reason of his professional training or experience, without any compensation other than the fee of an ordinary witness.

Therefore, as to facts within his knowledge, a physician or surgeon or other scientific or professional witness stands upon an equality with other witnesses.

Where a duty is imposed by law and the compensation for the performance of that duty is fixed by law, no compensation can be exacted or enforced for performing it in excess of that

which the law allows. It was early decided in England that a promise to pay a greater amount than the legal compensation is a promise without consideration (*Collins* v. *Godefroy*, I. B. & Ad. 950). As a logical consequence, a witness has no legal right to recover payment on the basis of the actual value of his testimony to a party to a suit. For such services as are rendered under the requirements of law, he can recover by law only the statutory fees. In the leading American case on this subject (*Dodge* v. *Stiles*, 26 Conn. 463), in discussing the doctrine just stated, the court said:

> Were it otherwise, and witnesses might be allowed to make terms for testifying, there would be room for oppressive conduct, and for corruption. Witnesses, knowing that their testimony was indispensable, would, under one pretense or another, make terms for their testimony, and such as might be induced to represent their testimony as important would be tempted to barter their oaths at the expense of truth and justice.

The doctrine that denies the right to charge for testifying as a witness more than the statutory witness fee is based in the majority of cases, however, on the ground that a contract for such excess payment is against public policy, because it is the duty of every citizen to give his services in testifying in any court proceeding when he is properly summoned to perform that duty. But no matter what may be the origin and justification of the doctrine, an agreement exacted by a witness from a person desiring his testimony, to compensate him beyond the statutory fee for time and service, is unenforceable.

Furthermore, a contract to pay a witness for testifying, coupled with the condition that the right of compensation depends on the result of the suit in which his testimony is used, is contrary to public policy and void, because it tends to perjury and the perversion of justice. *Clifford* v. *Hughes*, 139 App. Div. 730, 124 N. Y. S. 478; *State* v. *First Bank of Nickerson*, 114 Neb. 423, 207 N. W. 674, 45 A. L. R. 1418; *Miller* v. *Anderson*, 183 Wis. 163, 196 N. W. 869, 34 A. L. R. 1529; *County of Campbell* v. *Howard*, 133 Va. 19, 112 S. E. 876.

But while a physician, in performing such service as every other citizen of the state performs under the provisions of the statute, may not lawfully exact extra compensation, he cannot be required to make any examination or preliminary preparation in order better to fit himself to give his opinion as an expert. Services of this kind do not fall within the rule relating to the duties of an ordinary witness, and for such services a physician may demand compensation. If the service required of the expert is such that he cannot be compelled to render it under the ordinary process of the court, an agreement by the person seeking such special service, to compensate the expert for it, is valid. *Barrus* v. *Phaneuf*, 166 Mass. 123, 44 N. E. 141, 32 L. R. A. 619; *Burnett* v. *Freeman*, 125 Mo. App. 683, 103 S. W. 121; *Schofield* v. *Little*, 2 Ga. App. 286, 58 S. E. 666; *Flinn* v. *Prairie County*, 60 Ark. 204, 29 S. W. 459, 27 L. R. A. 669, 46 Am. St. Rep. 168; *Brown* v. *Insurance Company*, 26 App. Div. 544, 50 N. Y. S. 729; Note, 16 A. L. R. p. 1463.

Applying to the present case the principles of law stated above, so much of the evidence as sought to establish the physician's right to compensation for the loss of three days' time in attendance on the court at the trial in which he was a witness was improper, and a judgment based on it cannot stand. Moreover, the physician in this case, in pressing his claim for payment, emphasized the fact that his testimony helped the defendant win the suit and admitted that he based his fee on that fact as well as on the actual value of his services, and on that account his claim comes within the prohibition against the making of contracts to pay a witness for testifying, coupled with the condition that the right of compensation depends on the result of the suit in which he testifies. The court held, therefore, that the physician-plaintiff in this case could claim only what would be a proper charge for the examination he made prior to the trial, of the person injured by the defendant's truck, and for the time spent in preparation of his testimony in connection with that examination. Even then, it must appear that the contract, either expressed or implied, made by the physician with the defendant corporation, called for the performance of such service.

The case was therefore reversed and remanded for a new trial.

Gauze Left in Operation Wound

(Blackburn v. Baker (N. Y.), 237 N. Y. S. 611)

The physician in this case performed an emergency abdominal operation on his patient. Prior to the operation he had diagnosed her case as either a rupture of a fallopian tube, caused by an extra-uterine pregnancy, or acute appendicitis. The operating room was prepared by two nurses employed by the hospital. In view of the diagnosis, they brought to the room strips of gauze with metal snaps attached, called "pack-offs," in two sizes, one size about seven feet long and six inches wide, to be used if the incision was large and the hemorrhage profuse, and a smaller size, about fifteen inches long and three inches wide, the size ordinarily used in appendectomies. It was the duty of one of the nurses to saturate pack-offs in a saline solution and to hand them to the physician when requested. The incision disclosed a ruptured fallopian tube. A count was kept by the physician and by one of the nurses of the pack-offs placed in the abdomen. From that count, it appeared at the conclusion of the operation that all of them had been removed. Moreover, the physician and his assistant made a manual examination of the abdominal cavity before it was closed and found no foreign substance in it. So far as the physician, his assistant and the nurses knew, none of the small pack-offs were used. Some months later, however, one was discovered in the patient's abdomen, and an operation was performed to remove it. The patient thereupon sued her physician for malpractice.

The patient proceeded on the theory that the leaving of the pack-off in the abdomen made negligence and lack of skill so obvious that expert testimony was unnecessary. She therefore introduced no evidence to show the court that her physician had not used proper methods or had been negligent. On the other hand, an expert testified for the physician-defendant that proper methods were used, that a more extensive search for foreign substances in the abdominal cavity would have been unwise, because it might have caused paralysis of the intestines, and that it was proper and customary for an operating surgeon to rely on the nurse's count of sponges, pack-offs and gauze placed in and removed from an incision. There was a verdict in favor of the patient, and the physician moved for a new trial, contending that the verdict was against the weight of the evidence. On the refusal of the trial court to grant the motion, he appealed to the Supreme Court of New York, Appellate Division, Third Department.

"The presence of the pack-off in the abdomen after the first operation," said the Supreme Court, "standing by itself, suggested that proper care had not been used, and required defendant to offer proof in explanation. But, when defendant's expert witness stated that proper and approved methods were used in the operation, the possible inference of negligence because the pack-off had been left in the abdomen was destroyed." The court then quoted with approval from *Benson* v. *Dean*, 232 N. Y. 52, 133 N. E. 125:

> The court instructed the jury, over defendant's exception, that the mere breaking of the needle alone was not necessarily negligence, but might be some evidence of negligence. The plaintiff failed to offer any evidence to rebut defendant's evidence that surgical needles occasionally break, even when the operator uses the highest degree of skill and care. The evidence of the first operation, coupled with the presence of the broken needle in the abscess, standing by itself, might . . . have been enough to put defendant to his proof. *Goldstein* v. *Pullman Co.*, 220 N. Y. 549, 554, 116 N. E. 376, L. R. A. 1918B, 1060. Common sense suggests that the condition discovered by Dr. Saphir was incompatible with successful surgery and medical treatment. But when the evidence of the defendant's surgeons came into the case, with a reasonable explanation showing what may happen when the proper degree of care and skill is actually exercised, the possible inference of negligence from the breaking of the needle alone was driven out, and the jury should have been so instructed. The rule of res ipsa loquitur put upon the defendant the burden of going on with the case (*Davis* v. *Kerr*, 239 Pa. 351, 86 Atl. 1007, 46 L. R. A. (N. S.) 611), but, in the absence of medical evidence to the contrary, it must be assumed on this appeal that the breaking of the needle was not due to negligence.

The defendant, in this case, as an operating surgeon, was not chargeable with the negligence, if any, of the nurses employed by the hospital. *Baker* v. *Wentworth* 155 Mass. 338, 29 N. E. 589.

For the reasons stated, the judgment of the lower court was reversed and a new trial granted.

Society Proceedings

COMING MEETINGS

American Medical Association, Detroit, June 23-27. Dr. Olin West, 535 North Dearborn Street, Chicago, Secretary.

American Association for the Study of Goiter, Seattle, July 10-12. Dr. J. R. Yung, 670 Cherry Street, Terre Haute, Ind., Secretary.

American Association of Industrial Physicians and Surgeons, Detroit, June 23-24. Dr. V. S. Cheney, Armour and Company, 43d Street and Racine Avenue, Chicago, Secretary.

American Association of Medical Milk Commissions, Detroit, June 23-24. Dr. Harris Moak, 360 Park Place, Brooklyn, New York, Secretary.

American Dermatological Association, Cleveland, June 19-21. Dr. C. Guy Lane, 416 Marlborough Street, Boston, Secretary.

American Federation of Organizations for the Hard of Hearing, New York, June 16-19. Miss Betty C. Wright, 1601 Thirty-Fifth Street, N. W., Washington, D. C., Secretary.

American Heart Association, Detroit, June 24. Dr. I. C. Riggin, 370 Seventh Avenue, New York, Executive Secretary.

American Pediatric Society, Montreal, June 17-19. Dr. H. C. Carpenter, 1805 Spruce Street, Philadelphia, Secretary.

American Physiotherapy Association, Detroit, June 23-24. Miss C. H. Ballard, St. Francis Hospital, San Francisco, Secretary.

American Proctologic Society, Buffalo, New York, June 22-24. Dr. Curtice Rosser, Medical Arts Building, Dallas, Texas, Secretary.

American Radium Society, Detroit, June 23-24. Dr. G. W. Grier, 500 Penn Avenue, Pittsburgh, Secretary.

American Society of Clinical Pathologists, Detroit, June 20-23. Dr. H. J. Corper, Metropolitan Building, Denver, Secretary.

American Therapeutic Society, Detroit, June 20-21. Dr. William J. Mallory, 1720 Connecticut Avenue, Washington, D. C., Secretary.

Association for Research in Ophthalmology, Detroit, June 24. Dr. Conrad Berens, 30 East 40th Street, New York, Secretary.

Association for the Study of Allergy, Detroit, June 23-24. Dr. Warren T. Vaughan, 118 East Franklin Street, Richmond, Va., Secretary.

Association for the Study of Internal Secretions, Detroit, June 23. Dr. F. M. Pottenger, Monrovia, Calif., Secretary.

Association of American Teachers of the Diseases of Children, Detroit, June 24. Dr. Ralph M. Tyson, 334 South 21st Street, Philadelphia, Secretary.

Idaho State Medical Association, Coeur d'Alene, June 27-28. Dr. Joseph N. Davis, Kimberly, Secretary.

Massachusetts Medical Society, Plymouth, June 17-18. Dr. Walter L. Burrage, 182 Walnut Street, Brookline, Secretary.

Medical Library Association, Montreal, June 24. Miss Sue Biethan, General Library, University of Michigan, Ann Arbor, Secretary.

Medical Women's National Association, Detroit, June 22-24. Dr. Elizabeth Kittredge, 3906 McKinley Street, Washington, D. C., Secretary.

Minnesota State Medical Association, Duluth, July 14-16. Dr. E. A. Meyerding, 11 West Summit Avenue, St. Paul, Secretary.

Montana, Medical Association of, Butte, June 30. Dr. E. G. Balsam, Box 88, Billings, Secretary.

Pacific Northwest Medical Association, Butte, Montana, July 1-3. Dr. Frederick Epplen, 639 Stimson Building, Seattle, Secretary.

Wyoming State Medical Society, Sheridan, July 15-16. Dr. Earl Whedon, 50 North Main Street, Sheridan, Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS

Forty-Fifth Annual Meeting, Held in Atlantic City, N. J., May 6-7, 1930

The President, DR. THOMAS MCCRAE, Philadelphia, in the Chair

General Medicine and Its Subdivisions

DR. THOMAS MCCRAE, Philadelphia: There is one change taking place in medicine at this time the influence of which is hard to estimate; namely, the tendency to split up general medicine into various departments. There is a danger of carrying this too far, so that we shall soon have so many divisions that there will be no department of general medicine left. This is sometimes due to imitation, for individuality seems to be as rare in institutions as it is in individuals. Each medical school or hospital should do what is best for its own particular problems. The fashion for subdivision may be carried too far and a department of medicine may become only a group of units, each working separately and with little relation to the department as a whole. To secure the advantages of intensive study without losing the broad outlook of general medicine is a difficult matter. The separation of tuberculosis from general medicine did harm to both. Let us hope that we do not go as far in this direction as the surgeon who handled fractures of the right leg but not of the left. Too much division is harmful for medicine, medical education and the welfare of the patient.

SYMPOSIUM ON PROBLEMS OF CORONARY ARTERY DISEASE

Sclerosis and Occlusion of the Coronary Arteries

DRS. OSKAR KLOTZ and W. D. M. LLOYD, Toronto: Forty-four cases of partial or complete occlusion came to autopsy. Twenty-six of these were merely sclerosis, that is, without complete occlusion. The lumen of the artery was narrowed. There were eighteen cases of coronary thrombosis, all accompanied by sclerosis. The patients were all adults. Patients with acute involvement were excluded from this list. We also omitted cases of coronary occlusion due to change in the wall of the aorta, the latter being the typical syphilitic cases. In those cases associated with endarteritis or atheroma, the disease was in the end-stages and there was no evidence of what the earlier stages might have been, although the lesions had evidently progressed from the earlier stages. The early stages of these lesions have been noted in patients as young as 1 year, and several times in the second decade of life. The degenerative changes noted took place in the intima and were due to fatty degeneration. The sclerotic changes observed in the fifth and sixth decade are very similar. Rheumatic disease was found to attack the small arterioles in the mesochondrium. These are not uncommon, but we have not found it to be the rule in our series. The lesions in the media were secondary in nature. No primary changes in the media were noted. The lesions were multiple and took place in both the right and the left coronary arteries. The most common location of the sclerosis was in the descending portion of the left branch; the second most common, in the left coronary, and the third, in the right coronary. Sclerosis obstructing the orifice is more common in the right than in the left coronary. The thrombotic process appeared to be of secondary nature and took place by dilatation, with development of a thrombus.

In our cases the age average was from 55 to 60 years; 90 per cent of the cases were in males. The average duration of angina pectoris was thirty months. Hypertension existed in 61 per cent; syphilis in 11 per cent, and diabetes in 20 per cent of the cases. In regard to the myocardium, hypertrophy occurred in 90 per cent, and dilatation in 70 per cent. There had been recent thrombosis in the heart cavity in 30 per cent of the cases.

Subsequent Course and Prognosis of Coronary Thrombosis

DR. LEWIS A. CONNER, New York: I do not think that we can distinguish between coronary thrombosis with infarction and acute infarction without actual thrombosis. Two hundred and eighty-seven patients were studied, 243 men and 44 women. Antecedent disease in 274 cases was as follows: arterial hypertension, 93; syphilis, 39; diabetes, 28. When the age groups were divided into five year periods, the figures showed that 3 per cent of the cases occurred before 35 years; 11 per cent from 41 to 45 years, and 22 per cent from 50 to 60 years. From 61 to 65 there was a very sharp drop. Seventy-five per cent of all cases occurred before the age of 61. As regards sex, it was found that the women lagged behind the men in the early cases, but a large proportion of first attacks in women occurred between 55 and 60 years. When these cases were compared with those of hypertension, there was a lag behind in early years in both sexes; also in the men in middle life and in women in later years. When the cases were compared with those of syphilis, there was a shifting of the age toward the younger period. In cases of diabetes there was a shift toward the decade between 50 and 60.

In regard to fatality, of the 287 patients, 117 are alive and 55 per cent are dead. Twenty-eight have been lost from sight. Forty-six died in the first attack and 96 died following the first attack. As to duration of good health after the first attack, 89 were well, and 28 of these continued well up to the second attack and then died. The total duration of life varied from three months to seventeen years after the first attack, distributed as follows: three months, 109 cases; six months, 101 cases; one year, 88 cases; two years, 65 cases; three years, 49 cases; four years, 40 cases; five years, 25 cases; six years, 17 cases; seven years, 15 cases; eight years, 7 cases; nine

years, 4 cases; ten years, 4 cases; eleven years, 3 cases; twelve years, 2 cases, and seventeen years, 1 case.

The relation of prognosis to the severity of symptoms was as follows: 68 per cent of the patients died following very severe attacks and 10 per cent died with mild attacks; 31 per cent recovered from very severe attacks; 43 per cent recovered from moderate attacks, and 26 per cent recovered from mild attacks. Thus it would seem that very severe attacks are frequently recovered from. In regard to previous symptoms, 38 per cent had had symptoms and 62 per cent had had no symptoms previous to the first attack. The interval between the first and second attacks in 50 per cent of the cases was less than one year, and in the others it was from three months to eighteen years. In some cases there were more than two attacks. One patient had seven attacks before he died. Embolism occurred in 42 cases. Electrocardiograms were made in 151 patients; 21 showed normal tracings, of whom 14 are living and 7 have died. There was T wave change in 37. With heart block, 4 survived and 2 died. With auricular fibrillation 5 lived and 10 died. With bundle branch block, 4 lived and 10 died. These last two lesions give a very grave prognosis.

These studies seem to show that we have to look on coronary thrombosis as a disease of early middle life. If the underlying condition is arteriosclerosis, perhaps some of the changes are occurring in other organs. Diabetes may be caused by thrombosis of the pancreatic artery. Kidney embolism may be due to thrombosis. We have to consider this whole subject very carefully. There may be clinical pictures in the other arteries coinciding with and similar to those in the coronary system.

Syphilis as a Factor in Coronary Artery Disease

DR. A. S. WARTHIN, Ann Arbor, Mich.: Studies for the past twenty years at the University of Michigan in my own laboratory show that latent syphilis in the male is extremely common. In a series of 1,675 autopsies made in twenty-five years, there were 408 males and 86 females in whom active lesions were present in the aorta or central nervous system. In the studies made from 1910 to 1919 there were great variations in different years. In one year the number of cases ran as high as 60 per cent. In one year it dropped to 25.7 per cent, but the average for the ten years was 43 per cent. In the years from 1910-1919 there were 53 cases of coronary sclerosis with active involvement of the vasa vasorum in 169 cases of syphilis seen at autopsy.

In the years 1919-1929 there were 332 cases of syphilis seen at autopsy and of these 172 showed coronary sclerosis. There were 55 cases of coronary syphilis and 5 cases of coronary thrombosis. In the years 1910-1919, as also in the next decade, it was found that cases of coronary sclerosis were a little more numerous in syphilitic than in nonsyphilitic persons. Sudden death has a higher incidence in syphilitic than in nonsyphilitic patients. Deaths in the syphilitic patients occurred ten years earlier than in nonsyphilitic patients.

In regard to diffuse myocardial fibrosis, I believe it occurs as a result of the chronic myocarditis. Arteriosclerosis is found to be more common among syphilitic patients. The important difference between cardiac patients having or not having syphilis is that the incidence of sudden deaths and of early deaths is higher among those with syphilis.

Electrocardiographic Studies in Experimental Myocardial Ischemia

DRS. R. W. SCOTT, H. S. FEIL, L. N. KATZ and R. A. MOORE, Cleveland: Electrocardiograms were made in cases of experimental pericardial effusion in dogs. A change in the electrocardiogram occurred both experimentally and clinically. Increased hydrostatic pressure in the pericardial sac produced ischemia. In our experiments, dogs were anesthetized with barbital and the chest was opened. The ramus descendens of the left coronary was tied at various levels, and the inferior vena cava was ligated for five minutes. The heart was then removed for examination. Twenty-five animals survived the shock. Eight animals developed auricular fibrillation. There were no marked R T deviations with ligature of the ramus descendens for thirty minutes. It was found that ventricular extrasystoles and ventricular tachycardia produced R T deformities. Ligature of the vena cava gave negative results, because the collateral circulation is extremely abundant. If the coronaries were tied, the chart showed the influence of extrasystoles and tachycardia. In short, ligature of the descending branch of the left coronary caused no R T deviation, but further impairment of the vena cava produced R T deviation as seen in coronary thrombosis. Development of an abnormal mechanism, such as tachycardia or extrasystoles, produced deformities of the R T tracing typical of coronary occlusion.

Significance of Electrocardiogram in Chronic Cardiac Disease

DR. E. P. CARTER, Baltimore: In the past few years there has been an attempt to make use of the electrocardiogram in coronary disease to localize the site of the insult as well as the extent of the myocardial injury, without sufficient emphasis on the duration of the trauma, and without sufficient reliance on a properly correlated clinical diagnosis. There has been a tendency toward the development of a too submissive attitude to the written record without enough emphasis on the clinical correlation.

We are particularly indebted to Dr. Pardee for emphasizing the clinical significance of the end-phase of the ventricular work and the deflections recorded in the presence of coronary thrombosis or diffuse myocardial lesions, but we must not attribute too much importance to cardiograms or we shall fail to appreciate the value of clinical diagnosis. I had a group consisting of 185 cases that came to autopsy showing anomalies of the end-phase. These lesions, which depend on interference with the coronary circulation, are due to ischemia or local anoxemia and the significance of the changes in the electrocardiogram depends on the rate at which the lesion develops following changes dependent on the degree of or absence of intercoronary anastomoses. Thus the perturbation of the end-phase represents the degree of anoxemia present in the myocardium. I should like to emphasize the significance of lesions leading to diffuse myocardial disease as distinct from lesions of the septum and main stem or lesions involving the vascular supply without the myocardium. We see lesions due to toxic changes and also to systemic change, as in myxedema, and in such cases changes in the end-phase must be interpreted by a study of the clinical picture. As cardiologists, we cannot make a diagnosis on the appearance of the galvanometric tracings without due recognition of the clinical picture; otherwise our diagnoses are fallacious.

DISCUSSION ON CORONARY ARTERY DISEASE

DR. J. B. HERRICK, Chicago: Last year I brought up some still unsolved problems connected with obstruction of the coronary artery, and they are yet far from settled. I heartily endorse what Dr. Carter said as to the great importance of a more careful clinical and general study. We do not know how to assess the element of pain, the different radiation and the varying degrees of persistence of pain. Dr. Conner has shown that symptoms of pain often appear for the first time after an initial attack. Sometimes anginal pain does not disappear after the attack. Dr. Carter emphasized the great importance of studying the case clinically, not relying too much on the electrocardiogram. We do not always know how to interpret the electrocardiogram. There is a great deal of difference between acute and permanent obstruction. A gradual obstruction may show quite different phenomena from a sudden one, and some cardiograms are disturbed from some quite different cause than acute obstruction. I should like to repeat the caution uttered last year, and that is that these cases need a more careful study from every point of view. I would raise one question: Is this disease more frequent than it used to be? I think the gravest factor as to frequency is the one that is not recognized but was described by pathologists in former days, as in an article by René Marie and in one by Sternberg, in which it was spoken of as infarct of the myocardium or as pressure embolism of the heart. These papers were written from the pathologic, not the clinical, point of view. The cases were not noticed clinically, but they were here just the same. Now they are described by clinicians, but it does not mean that

they are more frequent. It may be, however, that these cases are more frequent, because more people are living to old age, and therefore more of these lesions occur, but I agree with Dr. Conner that many of these cases occur between 40 and 55. That fact is striking, when we realize that permanent lesions are more apt to be present in older ages. There is also something in modern life that tends to produce this condition. We are living strenuously. I have been forced to look for a factor, and I have even wondered if the gases from automobiles have a tendency to produce thrombi. Still, the fact that cases are recognized more frequently does not make them more frequent.

DR. W. S. THAYER, Baltimore: Dr. Klotz's paper on changes in the coronaries reminds me of the case of a young house physician, who died in his twenties on the thirteenth day of typhoid. At autopsy it was found that there was an area of acute endarteritis encircling the vessel. This area would be followed by constriction and occlusion. It struck me as an instance of what might have given rise to serious coronary changes later in life had the patient survived. Dr. Conner's remarks as to prognosis interested me very much. From the standpoint of medical practice, this is one of the most important factors in connection with coronary disease. Coronary prognosis is rather better than we regarded it at first. It is the key to treatment of the condition. It is one aspect which the practitioner can do more with than anything else in practice. One of the most important principles that we have taken from Osler is the necessity of rest under treatment of all sorts of maladies, but in coronary disease it is vital for two reasons: first, because in many instances the patient's heart muscle needs rest, and second, because the patient needs to be adjusted mentally to his condition, and that can be done only over a long period, during which the physician is laboring hard to make the patient understand what his condition is. The only way to train the patient is to put him to bed for weeks. If one can show the patient what one can do for him by rest and massage, one can train him so that he will live for many years. I should like to reiterate what Dr. Carter has said as to the importance of the x-rays and the electrocardiogram in relation to clinical examination.

DR. F. N. WILSON, Ann Arbor, Mich.: I heartily agree with Dr. Carter that the electrocardiographic changes which he discussed are in no sense specific; that is to say, a given change in the form of the electrocardiogram may depend on a variety of disease processes. There is fundamentally no difference in the significance of data obtained by electrocardiographic examination and data obtained by means of the stethoscope, by roentgen examination or by any other method of examining patients. The electrocardiographic observations must be interpreted in the light of information obtained in other ways. The electrocardiographic changes associated with infarction of the myocardium are related to the monophasic responses obtained in the physiologic laboratory by placing one electrocardiographic electrode on an uninjured and the other on an injured region of the heart's surface. In the mammalian heart, monophasic responses persist for only a few minutes, although the electrocardiogram remains abnormal for a much longer period, of which the exact duration is uncertain. After the injured muscle dies, of course, it no longer exerts an effect on the electrocardiogram. During the past year we have developed new methods of studying the electrocardiogram which we hope will throw new light on the subject of electrocardiographic interpretation. By taking precordial leads, as well as the usual three leads, much additional information concerning the spread of the excitation process over the heart and also, we believe, regarding the final deflection of the electrocardiogram may be obtained. It is hoped that much information may be gained from such leads in coronary thrombosis. By measuring the area under Q-R-S and also under T, the normal relation between T and Q-R-S and the variations of this relation in disease may be studied. By this method abnormalities of T may be recognized and studied quantitatively even when they are associated with changes in Q-R-S; that is to say, we believe it possible to determine whether a given abnormality of T is or is not dependent on an associated abnormality of Q-R-S.

DR. EMANUEL LIBMAN, New York: I should like to speak of further effects of coronary artery occlusion, whether due to arterial disease per se or mainly to thrombosis. Of great interest is the influence on the papillary muscles, especially the posterior muscle on the left side. This is supplied by the descending branches of both coronary arteries and these are frequently diseased. Rupture of the muscle occasionally occurs, usually as a result of thrombotic disease. Fibrosis and atrophy not infrequently take place in the muscle and may lead to chronic dilatation of the heart. As far as I know, this condition has not hitherto been described. The other result of coronary artery disease which must be described is aneurysm of the left ventricle. We must ask ourselves what the importance of such aneurysms is, and whether or not clinical differences are encountered, as compared to the cases of coronary occlusion in which it is not present. There are certain differences: there is added the liability to rupture of the heart and a tendency to intraventricular thrombosis and consequent embolism. If the septum is involved there may be marked pressure on the right heart, especially the tricuspid valve, and the addition of insufficiency of the right heart to that of the left. How frequent are such aneurysms? I have suspected their presence forty-four times during the past three years, which comprises 27 per cent of all cases in which I suspected the presence of marked coronary occlusion. During the past three years, in his postmortem examinations, Dr. Klemperer found that 50 per cent of all cases of marked occlusion revealed an aneurysm somewhere in the heart and that the figure for aneurysm of the anterior wall of the left ventricle is 38 per cent. Another point of importance in the clinical recognition of this particular group is a gallop rhythm of anapestic type, heard best at the left border of the sternum low down. René Marie made the same observation. He should therefore be credited with it. I find no mention in his study of the important fact that one should try to find the gallop rhythm while the patient is lying down. It may be absent when the patient stands. I am not convinced that the occurrence of coronary thrombosis is simply a part of the arterial disease. Of course, if an artery is narrowed, or roughened, thrombosis may more readily take place. The local thrombosis, I believe, is essentially a part of a general condition. Patients who develop coronary thrombosis not infrequently have suffered an earlier thrombosis of the arteries of the lower extremities or the brain. It is not uncommon to have a cerebral thrombus take place later. That embolic cerebral occlusions due to intracardiac thrombosis also occur is well known. Just recently I observed in a woman in the early sixties a cerebral thrombosis, followed in less than twelve hours by the typical picture of coronary artery thrombosis.

DR. ROBERT LEVY, New York: Dr. Warthin's figures tend to show how infrequently the diagnosis of angina pectoris can be made. We undertook to study mild types of coronary thrombosis, some associated with severe pain but all with electrocardiographic changes suggesting thrombosis. Some were mild in the sense that the patients had an unusually rapid recovery. The matter of prognosis was carefully studied and it was found that it was not so much the severity of the initial symptoms as the rate of recovery that in most cases helps to determine the ultimate outcome. In some of the cases a second attack followed in five or six years in which the patient died. We experienced difficulty in keeping the patients in bed twenty-four hours after recovery if the attack was over quickly. I agree with Dr. Carter that the electrocardiogram will not make the etiologic diagnosis, although it furnishes a record of the degree of disturbance in the heart muscle. A complete diagnosis can be made only from a careful clinical study.

DR. H. M. SMITH, Boston: The electrocardiogram may give us great help in certain types of lesions, as in coronary occlusion. In other cases the condition is undergoing constant modification, and often the patient does not have the electrocardiogram made early enough. We found that the changes in the electrocardiogram were in general proportional to the changes in the coronary. The fact that Dr. Scott ligated the vein may make a difference in the tracing. Changes were

induced in the electrocardiogram because extra work was placed on the heart. We found that ligation of the circumflex artery brought about changes in the coronary circulation. In our work the relation between the circulation and the work of the heart was strikingly shown, as were also minor changes, such as fall in blood pressure.

DR. JOSEPH T. WEARN, Boston: I should like to emphasize what has been said as to the necessity of rest in coronary sclerosis as well as in syphilitic aortitis. We had two cases of complete occlusion of the coronaries and there have been several instances in which sclerosis has practically closed both coronary arteries. The element of time enters largely into these cases. Sclerosis is a slow process, and syphilis is a slow process. For a long time the patients go without symptoms, and yet hardly any blood gets into the coronary arteries. These are in contrast to the sudden cases of occlusion. Putting these patients to bed allows the circulation to become compensatory. The thebesian circulation enters the picture and compensates for the coronary occlusion, as it takes on the work of nourishment of the heart muscles. Another point that I think is important in these cases is the avoidance of emotional excitement. For some time I made a study of records in the newspapers and noted instances in which patients suddenly dropped dead in the midst of some emotional stress.

DR. NORMAN M. KEITH, Rochester, Minn.: Barnes, Mann and Markowitz of Rochester are carrying out experiments reinvestigating the electrocardiographic changes resulting from occlusion produced by ligation of various branches of the coronary arteries in dogs. It has been found that the electrocardiographic changes so produced do not parallel exactly the tracings obtained in man following occlusion of analogous vessels. On the other hand, it does appear that ligation of a branch of the right coronary artery producing infarction in the right ventricle produces electrocardiographic changes which are characteristically different from those obtained when a branch of the left coronary artery is ligated. It should be noted that the operative procedure and incision of the pericardium involving a possible change in the axis of the heart must be taken into account in interpreting these results. This factor has not been evaluated completely as yet. Many of these animals have been under observation for weeks after operation. On the whole, it seems possible to correlate the results to date with electrocardiographic changes observed in man following coronary occlusion, as described by Barnes and Whitten.

DR. A. A. WARTHIN, Ann Arbor, Mich.: The essential pathologic change in angina pectoris was that of progressive infarction, and this was the same condition found in sudden death with a previous history of syphilis. These cases were cases of coronary disease without a history of valvular lesions.

DR. W. G. MCCALLUM, Baltimore: There is one condition which I did not hear mentioned, and that is the anatomic distinction between closure of the right coronary and of the left coronary. The one of most importance is the right coronary. On examination of the open artery the posterior half of the septum of the wall of the right ventricle behind the mitral valve is thin. One can drop it into the cavity. In the left coronary, on the other hand, obstructive necrosis exists at the narrow part of the septum at the apex, which causes aneurysm. The process extends through the right ventricle and gives rise to embolism of the pulmonary artery. The distinction is extremely sharp when seen at autopsy.

DR. LEWIS A. CONNER, New York: In view of Dr. Libman's views on the subject of a tendency to thrombosis in other parts of the body, we were prepared to find evidences in other vessels, but there were very few—only four cases—in which this occurred, the condition being cerebral or from some other process. There were four cases of venous obstruction in the femoral or other veins which developed after an attack, but they were probably due to an impairment of the circulation rather than constitutional tendency.

Decortication of the Heart for Adhesive Pericarditis

DRS. PAUL D. WHITE and E. D. CHURCHILL, Boston: Observations were made on a patient with suppurative pericarditis due to *Staphylococcus aureus* inflammation. The venous pressure as influenced by the intrapericardial exudate was recorded by a spinal fluid manometer. The patient, a boy, had extreme decompensation, intense edema, dyspnea, orthopnea, cyanosis and ascites. He made an uneventful recovery after surgical drainage. The diagnosis was adhesive pericarditis. The adhesions bound the mediastinum to the chest wall. The heart was enclosed as in a coat of mail, the valvular chambers being unable to dilate in diastole to receive the inflow of blood.

Another patient, aged 18, invalided for four years, showed cardiac decompensation, dyspnea, orthopnea, pitting edema, bilateral hydrothorax, enlarged liver and distinct kidney changes. The pericardium was thick and rigid. It was incised over the right ventricle. A band of fibrous tissue restricted the vena cava. Release of the heart from pressure produced very striking results. The edema disappeared, and a few months later the girl was able to lead a life of normal activity.

The Patient with Heart Disease as a Surgical Risk

DR. S. A. LEVINE, Boston: Four hundred and ninety-four operations were performed on 414 patients, under both local and general anesthesia. The mortality under local anesthesia was 12 per cent; that under general anesthesia was 12.1 per cent, making an average mortality of 12 per cent. We classified our fatalities as inevitable deaths and unexpected deaths. Our mortality for unexpected deaths was 6.3 per cent. We had 120 patients with organic valvular disease of the heart subjected to 147 operations. There were 72 cases of mitral stenosis; 11 of mitral insufficiency, and 37 of aortic disease. Among these cases there were 10 deaths, 7 unexpected and 3 inevitable, making a mortality of 2.1 per cent. One hundred and thirty-eight patients with chronic myocarditis, all but 7 over 40 years of age, were subjected to 167 operations. Among these there were 8 unexpected deaths, or 4.9 per cent mortality.

We had eighty-seven cases of auricular fibrillation in patients over 40. Seventeen patients had mitral stenosis and twenty-eight a thyroid condition. In this group there were three fatalities among ninety-nine operations. Six patients had paroxysmal auricular tachycardia, and three had attacks during the anesthesia; all survived. There were nineteen operations on patients with auricular flutter; one died, a mortality of 5.9 per cent. Eleven patients had syphilitic aortitis; all had aortic insufficiency and three had aneurysms of the aorta. There was one unexpected death. There were thirty-five patients with angina, with three unexpected fatalities, or 7.7 per cent mortality. There were twenty cases of coronary thrombosis with eight unexpected deaths, a mortality of 44 per cent. Of five patients operated on during an acute attack, only one survived. This indicates the risk of surgical measures during an acute attack, but if operation is delayed, so that the heart in some measure recovers, it can be carried out with a reasonable degree of security. Congestive heart failure, either before or after operation, occurred in thirty-eight cases with three deaths, a mortality of 10.2 per cent; twelve cases followed operation, with four deaths, or 33 per cent, the average for before and after operation being 17 per cent. Congestive heart failure is more serious if it develops after the operation. In regard to nephritis, there were 433 operations on 359 patients without nephritis, with 20 deaths, or a mortality of 4.9 per cent. Fifty-five patients with nephritis had sixty-one operations, with eight deaths, or 14.8 per cent mortality. Height of blood pressure seemed to have little influence on the mortality rate. In regard to age, of 414 patients 167 were under 50 and 247 were over 50 years of age. In the first group there were 192 operations with 5 deaths, or 2.8 per cent mortality, and in the latter 302 operations with 23 deaths, or 8.2 per cent mortality.

Certain Effects of Auricular Systole and Prematurity of Beat on the Intensity of the First Heart Sound

DRS. CHARLES C. WOLFERTH and ALEXANDER MARGOLIES, Philadelphia: A study was made of the variations of the first heart sound in auricular fibrillation, extrasystoles, arrhythmia, heart block and ventricular escape. The method of study consisted of the comparison of heart sounds, electrocardiograms and radial pulse curves optically recorded, taken simultaneously. It was found that the As-Vs time interval has a marked influ-

ence on the intensity of the first heart sound in heart block, both complete and incomplete, ventricular escape and extrasystolic arrhythmia. The changes do not appear to be dependent on differences in output per beat. The time incidence of changes within the normal interval of As-Vs intervals suggests that this influence may also be operative in the normally beating heart; and in the clinical evaluation of the first heart sound it will become necessary to discount the modifications to the length of the Vs-As intervals.

Prematurity of beats does not always have the same effect on sounds. The variations, however, appear to obey laws, some of which may be formulated at the present time. The influence of As-Vs intervals on the intensity of the first sound in extrasystoles overshadows differences due to the prematurity of the beats, except in the case of extremely premature beats. A rapid succession of beats in auricular fibrillation tends to cause intensification of the first heart sound after the initial beat of the series. Variations in the intensity of the first heart sound from beat to beat, when the ventricular rate is regular or nearly regular and the changes due to respiration are excluded, offer a valuable clinical sign of auriculoventricular dissociation. The sign, however, does not permit a differentiation between idioventricular rhythm and ventricular escape. Its absence does not exclude the possibility of auriculoventricular dissociation. Marked increase in intensity of the first sounds of slightly premature beats, when the rhythm is otherwise regular, is strong evidence in favor of extrasystoles.

DISCUSSION

DR. F. N. WILSON, Ann Arbor, Mich.: One difficulty that arises in estimating the intensity of the heart sounds is that the amplitude of the heart sounds in the record is dependent on the frequency. In our work we used the double string galvanometer, and we found that amplitude depends on the energy of the sounds and that the energy varies inversely with the frequency. Aortic insufficiency cannot be recorded. Mitral stenosis can be recorded. High pitched sounds are loud to the ear, small on the record. Low pitch will be distinct to the ear. One must therefore study the frequency and form of the individual variation.

DR. C. C. WOLFERTH, Philadelphia: We considered only the points that seemed to us of vital importance. Variations in frequencies are extremely minor in nature. Furthermore, our point of view is a clinical one. Many times we took extrasystoles and predicted from the difference in auscultatory sounds what we would expect to get on the records. What Dr. Wilson says is important. It makes it impossible to compare tracings of different individuals or even to compare tracings of the same individual at different times. We studied the frequency and came to the conclusion that it was not of consequence from the clinical point of view.

SYMPOSIUM ON NEW GROWTHS OF THE BRONCHUS AND LUNG

The Pathologic Aspect

DR. W. G. MCCALLUM, Baltimore: The combination of tuberculosis with cancer of the lung is not uncommon. I do not think we have any proof of the increase of cancer of this type, and as far as etiology goes, I do not think that we can prove anything. The histogenesis of these tumors shows extreme variety and we see only the end-stages of the growth, so that it is impossible to make any statement as to the early stages.

The Clinical Features

DR. ELMER H. FUNK, Philadelphia: The clinical picture varies greatly, depending on the following factors: (1) the location and rapidity of the growth; (2) the degree of bronchial obstruction; (3) the presence of infection and suppuration; (4) the pressure on adjacent structures; (5) the occurrence of pleural involvement, and (6) local and general metastases. These factors in varying combinations produce many dissimilar pictures not only with regard to the symptoms, local and general, but also with regard to the physical signs and the roentgen observations. Indeed, primary cancer of the bronchus and lung may, in its clinical features, imitate any other pathologic lesion occurring in the lower respiratory tract. Bronchial carcinoma is the most common form of intrathoracic new growth.

Of sixty-one patients with the disease seen during the past ten years, fifty were males and eleven were females; the youngest was a woman, aged 24, and the oldest a man, aged 73; all but two of the patients were over 35 years of age. The onset is usually insidious but may be sudden, with dyspnea, hemoptysis or pain. The incidence of local symptoms in this group was as follows: cough, 88 per cent; expectoration, 67 per cent; hemoptysis, 46 per cent; pain, 74 per cent, and dyspnea, 52 per cent. The expectoration was purulent and suggested pulmonary suppuration in one third of the group. Attention is called to the frequency of pleural manifestations, pain and effusion in one fourth of the patients studied. In three instances the effusion was purulent. Hoarseness was present in 8 per cent. Wheezing is common with bronchial obstruction. Loss of weight and strength is variable but was present in from 80 to 85 per cent. Fever was present in more than half the patients at some time during the period of study. Neurologic manifestations due to metastases were present in eight instances (13 per cent). The brain was involved in six instances and the spinal cord in two instances. Abdominal symptoms due to metastases were marked in four instances. Suppuration is common. Tuberculosis may coexist, although in this series tubercle bacilli were not found in any tests of the sputum.

The Bronchoscopic Aspect

DR. CHEVALIER JACKSON, Philadelphia: To the bronchoscopist the bronchoscope is a speculum. It enables him to look into the lung and adnexa. The lung can be examined by tapping, by x-rays and by bronchoscopy.

It makes little difference to the relatives, after a man is dead, what type of growth was in the lung, but as long as ventilation and drainage can be maintained, the natural defenses of the lung are intact; once a growth or foreign body acts as a cork, ventilation and drainage are destroyed. Often the bronchoscopist sees cases in which a diagnosis of asthma has been made on account of the wheezing. Wheezing at the mouth is a symptom of new growth. Papillomas act as corks of the main bronchi. Foul expectoration is frequently a sign of new growth of the lung. Many patients date their symptoms from an attack of influenza. Infection increases the stenosis. Suppuration is probably secondary to obstruction. Once ventilation can be reestablished, the infection can be handled.

Treatment by x-rays causes shrinkage of these growths and the patient sometimes remains free of symptoms for four or more years. We are now implanting radon seeds. It is too soon to state conclusions. From the clinical standpoint, if we are going to study benign as well as malignant growths of the lung, we must learn to look inside the bronchi and lung. We must become familiar with the bronchoscope.

DISCUSSION OF NEW GROWTHS OF THE BRONCHUS AND LUNG

DR. J. ALEXANDER MILLER, New York: Many of these cases of terminal cancer present evidence of inflammation with leukocytosis and purulent expectoration. Infection in the lung can predispose to cancer. Some of my cases have shown at autopsy that previous chronic inflammation has been the site of cancer. We have formed the habit of making examinations in all these dubious cases by means of bronchoscopy. In some cases of cancer of the lung the tumor can be removed, and cure will result if the diagnosis can be made in the earlier stages. It is difficult to tell about roentgen treatment. I have never seen patients that have not finally died, but it does seem as if we are making progress toward better manipulation of the chest. Our means of combating the disease are improving. We may get better results by removing the growth through the bronchoscope, and in time surgeons will remove malignant growth from the lung as well as from other parts of the body.

DR. C. V. WELLER, Ann Arbor, Mich.: There has been an increase of cancer of the lung with the influence of the

change in population. The outlook is not simple. It is not merely a factor of interest in pathologic literature or clinical examinations. In the first thousand autopsies these cases comprised 0.5 per cent. Now they form 2 per cent of all cases coming to autopsy. I believe there has been a difference in the interest in the condition. The interest has its source among the rank and file of the people. They know that they should go where roentgenographic and bronchoscopic tests are possible. The question of pain as a sign or symptom is important, especially when there are skeletal metastases. In one case the onset of pain in the left half of the chest coincided with an injury and the patient developed primary carcinoma of the lung.

Etiology of Abscess of the Lung

DRS. J. A. MILLER, G. G. ORNSTEIN and J. V. LICHTENSTEIN, New York: Anaerobic bacteria in suppuration of the lung used to be considered secondary invaders, but five years ago Dr. Lamb questioned whether anaerobes were not definitely pathologic factors. Since that time a great deal of work has been done by means of blood stream and intratracheal injections. It has been proved that it is possible to produce suppuration by anaerobic organisms from lung abscess. Cultures put into the vein or into the sinuses of dogs produced secondary abscess of the lung. Organisms from chronic infections of the teeth, tonsils and sinuses were used. These factors have practical application in the etiology and prevention of lung abscess. The organisms cultivated were of five types: spirochetes, fusiform bacilli, vibrios, motile bacilli, and anaerobic cocci. Pus from the cultures of the organisms would produce abscess, and we recovered from the lesions the five types originally put into the tissues. It was difficult to get them in pure culture. Bacteriologists know very little about these anaerobes. It was always difficult to grow the spirochetes, because when the transplants were made, the spirochetes disappeared. The motile bacilli are gram-negative. The anaerobic cocci had many of the characteristics of the colon group. They were universal in cases of abscess. They grew very luxuriantly and were obtained in pure cultures. The same lesions were obtained with these as with the whole group of the five organisms in the testicular tissue of the rabbit. The cocci were hemolytic streptococci. In three cases out of twelve they produced lesions. We believe that we should make further studies of the spirochetes and vibrios. The anaerobes were pathogenic for rabbits, but it is possible that the assumption that the disease is a spirochetosis is unwarranted.

Digitalis Therapy in Pneumonia

DR. WALTER L. NILES, New York: From 1927 to 1929 we made a study of the effect of digitalis in pneumonia. We divided the patients into four classes, according to whether treatment was with (1) serum alone; (2) serum and digitalis; (3) digitalis alone, or (4) neither serum nor digitalis. The digitalis was standardized by the cat methed of Hatcher. Two commercial preparations were used. One was found to be toxic, and it was discovered that it was twice as potent as the manufacturer had stated it to be. Fifteen one-hundredths cat unit was given per pound of body weight. The average light weight dose was 10 units; the average heavy weight dose, 12.5 units; the average daily maintenance dose, 2 cat units. The mortality was studied according to age, sex, type of pneumonia, severity of symptoms and blood culture. In the patients treated with digitalis, the following points were noted: With stronger preparations of digitalis, the mortality was higher. Mortality was higher in males than in females and was higher in the earlier and later decades. In type II pneumonia the mortality was slightly lower in the digitalis group in persons under 40. With positive blood cultures the mortality for all groups was about the same, that is, 79 per cent. Our conclusions were that after a careful consideration of the data, we would not be warranted in continuing the routine use of digitalis in pneumonia.

Cellular Reaction in Experimental Syphilis

DR. H. J. MORGAN, Nashville, Tenn.: I used the vital red staining method. I found an increase in the cells as regards size, products and activity of the mononuclears. The trypan blue stain showed a marked increase in the size of the cells. The phagocytic activities were greatly increased, as was shown by the enormous vacuoles containing dye. There was no evidence of fatty degeneration. There was an absence of nuclear division. This showed an exaltation of the physiologic activity of the cell. My conclusions were that syphilis produces a physiologic stimulation of the mononuclears.

Hepatic Changes Associated with Hyperthyroidism

DR. C. V. WELLER, Ann Arbor, Mich.: Hyperthyroidism is clinically identical with alteration changes in the liver of a fatty nature. In patients dying of hyperthyroidism, considerable defensive hepatitis has been shown. I tried to follow up a control series to check this finding. Studies were made of age and sex and cells of the thyroid and the liver were compared side by side. The latter showed considerable fibroblastic proliferation with lymphocytic infiltration. In our series we excluded syphilis of the central nervous system and any other disease causing chronic hepatitis. In hyperthyroidism the bile ducts showed a proliferation of connective tissue round the circle of the blood vessels. I feel that the coincidence of these two conditions is sufficiently common to be significant, but there is no definite etiologic conclusion to be drawn at the present time.

DISCUSSION

DR. L. G. ROWNTREE, Rochester, Minn.: This coincidence has frequently come to my attention at autopsy. At the Mayo Clinic we have a collection of a large number of livers which are extremely small. The changes are out of all proportion to what one would expect. We see marked changes in livers which have not been suspected. I should like to ask Dr. Weller whether he made any functional studies.

DR. H. M. SMITH, Boston: I should like to ask whether there is any correlation between the duration of the hyperthyroidism and the status of the clinical observations.

DR. C. V. WELLER, Ann Arbor, Mich.: In regard to functional tests, none were made that were of such a nature as to enable us to draw conclusions. I believe there is some correlation between the duration of the disease and the symptoms in syphilitic livers. We cannot escape that conclusion. If the patients have hyperthyroidism for a long time, there is fibroblastic proliferation and increase of connective tissue.

DR. ROWNTREE: Do small livers predominate?

DR. WELLER: Most of them are smaller than normal but not enough so to justify a diagnosis of diffuse atrophic cirrhosis. The patchy character of the lesions is very marked.

Clinical Study of Gumma of the Liver

DRS. JULIUS FRIEDENWALD and THEODORE H. MORRISON, Baltimore: Gumma of the liver is a rather uncommon disease. Males are far more susceptible than females, the incidence being greatest between the thirtieth and fiftieth years. A definite history of a primary infection cannot always be obtained. It is noted only in about 40 per cent of the cases. The time elapsing between the appearance of the primary lesion and the hepatic disease varied in our cases from three and one-half to twenty years. Previous diseases of the liver, as produced by alcohol and malaria, render the liver more susceptible to this condition. The clinical manifestations are rare in comparison to its frequency. Gumma of the liver is often latent. The factors especially involved in the production of symptoms are especially related to the size, extent and location of the lesion.

Before localizing symptoms occur, general manifestations, such as digestive symptoms, loss of weight, fever, jaundice and ascites, are frequently observed. The onset is usually gradual, the most important signs being pain and abdominal distention. Symptoms of indigestion begin to manifest themselves, often associated with chills and fever. With this there is progressive loss of weight, and not infrequently jaundice. The liver gradually enlarges and ascites is not uncommon. The most important sign, however, is the detection of a gummatous mass in the liver, which may occur in the form of nodules or as a large, rounded tumor, which may involve the left as well as the right lobe of the liver. Enlargement of the spleen also frequently occurs. The blood Wassermann test is most important but is

not always positive. The diagnosis is not difficult if a definite history of syphilitic infection can be obtained in a patient with a mass in the liver, who has discomfort and pain in the right upper quadrant of the abdomen with distention, indigestion, fever, loss of weight, jaundice, ascites and enlargement of the spleen. It is strengthened by a positive Wassermann test. The two diseases with which gumma of the liver may be especially confused are carcinoma and cirrhosis. In case of doubt the therapeutic test will clear up the diagnosis.

The prognosis is satisfactory if treatment is thoroughly carried out and undertaken sufficiently early before a resulting cirrhosis has developed. The results are striking. In spite of this, however, the persistent positive Wassermann reaction in the blood is well recognized, and it is frequently impossible to reverse this reaction in spite of intensive therapeutic measures.

The treatment consists in the administration of iodides and mercury. The effect of these remedies is extremely favorable. The masses, ascites and other symptoms disappear, and the liver and spleen rapidly diminish in size. The administration of arsphenamine is dangerous and its use is contraindicated.

DISCUSSION

DR. NORMAN GWYNN, Toronto: It is important to make the Wassermann test on the ascitic fluid. In three cases of gumma of the liver with arthritis of the spine, a Wassermann test of the spinal fluid and of the blood was done and was negative. When the ascitic fluid was tested, the Wassermann reaction was 4 plus.

DR. L. G. ROWNTREE, Rochester, Minn.: In the differential diagnosis by the bromsulphalein test, as regards disturbance of function by cancer, the disturbance is found to be out of all proportion to the size of the growth.

Experimental Studies on Raynaud's Disease

DR. WILLIAM J. KERR, San Francisco: I have had the opportunity during the past year of working in collaboration with Sir Thomas Lewis on problems of the blood supply to the human skin. Raynaud's disease was chosen as most suited to this problem. In this malady the digits become periodically pale or cyanotic and, after repeated attacks, lose tissue by means of a dry gangrene. Circulatory obstruction has been assumed to be the cause of this malady, but the manner in which this occurs has been a subject of debate.

Raynaud's description of the phenomena in 1862 was very complete; it was thought better, therefore, to attack the problem from the experimental standpoint and to bring about means to produce the attacks in order to study the mechanism. The temperature of the fingers of patients during attacks was found to be about 15 to 18 C., and immersion of the fingers in water of this temperature was able to produce attacks. Nine cases were chosen for more elaborate tests: three advanced cases; four of a mild type, and two of the intermediate type. The studies were made from November to April, in London, during very cold weather. After attacks produced by immersion in water at 15 C., recovery would take place at ordinary room temperature very rapidly, a violet color changing to red, and often the temperature of the fingers would become much higher than room temperature, indicating that a release of arteriole spasm had occurred and freshly oxygenated blood had returned to the digit. In severe cases, recovery in room temperature was slower and produced only a violet or cyanotic tint, which showed that only a small stream of oxygenated blood was reaching the end of the fingers. The vessels are not completely released from spasm. In milder cases the reaction to overcooling is favorable to the patient; in severe cases it is slight or absent. Our studies showed that in severe attacks with cyanosis or blanching, there is no circulation, as, if the finger is cut, it does not bleed. Numbness during the attack indicates that the vasomotor nerve endings are injured. In attacks of Raynaud's disease the discoloration begins at the tips of the fingers and proceeds toward the bases; when circulation returns, it returns to the bases and gradually extends to the tips. The venous circulation is not affected by Raynaud's disease. The digital arteries during an attack are in spasm throughout their length, and in some cases the palmar arteries are affected. There was no evidence that any central nervous system phenomena were concerned with this mechanism, but our studies led to the belief that the peripheral vessels are hypersensitive to local cooling.

In regard to ramisection, while removal of vasomotor control might produce relaxation of the vessels, one would not expect that the lesser nerve connections would exert any great influence on the vessels of the hand. The question of vasomotor influence in this disease is not yet settled. Our studies showed that with the overcooling treatments repeated two or three a day, by immersion of the fingers at 10 C. normal reactions in the arterioles may gradually be obtained.

Meningitis with Stormy Course and Prompt Recovery

DR. J. S. MCLESTER, Birmingham, Ala.: Three patients presented a clinical picture almost identical, so that it seemed as if they formed one group of cases. The first, a colored woman, aged 19, had headache, pains and malaise. She was five months pregnant. She showed diplopia, opisthotonos, a positive Kernig sign, a negative Babinsky sign, and râles in both lungs. She had marked secondary anemia. The Wassermann reaction was negative. The spinal fluid showed 1,400 cells, with mononuclears predominating. There was increased globulin but no organisms. The woman did not abort and made a complete recovery without sequelae. The symptoms in the other two patients were almost similar. They all followed some sort of respiratory epidemic and were probably related to influenza.

(To be continued)

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Diseases of Children, Chicago

39: 917-1152 (May) 1930

*Insensible Perspiration in Infancy and Childhood: II. Proposed Basal Standards for Infants. S. Z. Levine, M. Kelly and J. R. Wilson, New York.—p. 917.
*Antirachitic Effect of Winter Sunshine Through Celoglass: Results of Experimentation on Rats. T. S. Wilder, Germantown, Pa., and C. Vack, Boston.—p. 930.
*Underweight Children: Increased Growth Secured Through Use of Wheat Germ. A. F. Morgan and M. M. Barry, Berkeley, Calif.—p. 935.
*Five Years' Clinical Experience with Lemon Juice Milk. L. H. Barenberg, H. Abramson and W. H. Messer, New York.—p. 948.
Croup. D. M. Tolle, New York.—p. 954.
*Antirachitic Value of Winter Sunlight in Latitude of 42° 21' (Boston). E. T. Wyman, P. Drinker and K. H. MacKenzie, Boston.—p. 969.
Chronic Subdural Hematoma in Infants: Nine Cases: Review of Literature. D. Sherwood, Boston.—p. 980.
*Effect of Pilocarpine in Case of Sympathicotonia in Childhood. E. M. Landis and J. C. Gittings, Philadelphia.—p. 1022.
Safe Safety Pin. W. Colby, St. Paul.—p. 1031.
Pellagra Secondary to Gastro-Intestinal Disease. R. W. B. Ellis, Boston.—p. 1036.
*Unilateral Edema in Infant Aged Four Months. J. S. Leopold and J. L. Rogatz, New York.—p. 1045.
Infant Feeding in England and France from 1750 to 1800. T. G. H. Drake, Toronto, Canada.—p. 1049.
Diseases of Ear in Childhood. G. E. Shambaugh, Chicago.—p. 1062.
Robert Whytt 1714-1766. J. Ruhräh, Baltimore.—p. 1068.

Insensible Perspiration in Infancy and Childhood.—The basal insensible perspiration of 110 infants in varying stages of nutrition and ranging in age from 9 days to 25 months was determined by Levine et al. in 125 observations of from one to three hours' duration by the method of weighing. The subjects were all afebrile and free from acute infec-

tions during observations. The consistent results have led to the introduction of tentative standards and normal limits of variation for this measurement in infants on the basis of age, weight, height and surface area, analogous to the well known standards at present available for basal metabolism.

Antirachitic Effect of Winter Sunshine Through Celoglass.—Experimental evidence is supplied by Wilder and Vack to substantiate the data on the effectiveness of winter sunlight in Boston in the prevention and cure of rickets. Aside from a possibility that the sun's rays are least effective in February, and that a marked increase occurs at the end of March, quantitative differences have not been observed.

Increased Growth of Underweight Children Secured Through Use of Wheat Germ.—Two groups, including from thirty-one to forty-seven underweight children from 11 to 13 years of age, were compared by Morgan and Barry as to growth in weight, height and certain other physical measurements over three periods totaling thirty weeks. Each child in one of these groups in each period was required to include in the noon meal 3 ounces (85 Gm.) of rolls made with 50 per cent wheat germ and 50 per cent white flour. The control group took the usual white flour rolls; thus the former group ingested a total of 5 ounces of wheat germ per week. The weight increases in each of the wheat germ periods were about three times as great as in the control periods. The difference in all cases was five or more times greater than the probable error of the difference. The height increases were significantly greater in two of the wheat germ periods than in the corresponding control groups. Alveolar carbon dioxide tension was increased in a larger percentage of the children fed wheat germ than in the controls, a change possibly due to the diminished acidosis following increased food intake. The significance of these observations is discussed in relation to the recent discovery of the multiple nature of vitamin B and of the poverty of the major foods—fruits, vegetables, milk and meat—in the antineuritic substance (vitamins B, B_1, F). The importance of whole cereals, but more particularly of grain embryos, such as those of wheat and of rice, as a possible source of this vitamin is pointed out. The probable relation of the decreasing vitamin B content of the modern diet to decreased appetite in children, nervousness, constipation and possibly other gastro-intestinal disturbances is also discussed.

Five Years' Clinical Experience with Lemon Juice Milk.—An analysis has been made by Barenberg et al. of the records of 145 infants who received lemon juice milk for periods of from six to twelve months. This study embraced a five years' clinical experience with infants less than 3 months, from 3 to 6 months, and from 6 to 12 months old. In general, the infants who received lemon juice milk manifested a better rate of growth than those who received other milk preparations. A study was also made of the effect of lemon juice milk on the stools of infants during the course of parenteral infection. The period from January to May was selected for analysis, a time when respiratory infections are most prevalent and are usually associated with intestinal disturbances. Comparison made with a control group of children showed that among those who received lemon juice milk fewer cases of diarrhea developed and that these cases were milder. A more striking result was obtained when lemon juice milk was given prophylactically to a group of twenty-five older children and a comparison was made with a control group of fifty children of similar age. Although the number of infections during the four months was proportionately greater among those who received lemon juice milk, the number of instances of diarrhea was much less for this group. Lemon juice milk was found of value as a food for children suffering from pneumonia and other respiratory ailments. The preparation of lemon juice milk is simple. When diluted milk is used, the lemon juice is added to the water or other diluent, which is added slowly to the requisite amount of milk. If whole milk is employed, however, the fruit juice is added drop by drop, the solution being stirred after each drop in order to avoid curdling. The standard formula as recommended by Hess is as follows: milk, 24 ounces (710 cc.); water, 12 ounces (355 cc.); sucrose, ½ ounce (15 Gm.); lemon juice, 21 cc. The p_H of this mixture is about 5.30. In the routine use of this preparation for 145 infants, the authors have used, during the past few years, a somewhat larger amount of lemon juice, namely, 3 per cent, or 28 cc. per liter of dilute or whole milk, thus obtaining a still lower hydrogen ion concentration.

Antirachitic Value of Winter Sunlight in Latitude of 42° 21′.—The results obtained by Wyman et al. demonstrate that infants and children with rickets can be cured by sunshine in Boston (latitude 42° 21′) by exposing them during the months of November, December, January, February and March to sunshine transmitted through Celoglass.

Effect of Pilocarpine on Sympathicotonia in Childhood.—A case of sympathicotonia in a girl, aged 10, is reported by Landis and Gittings. The patient had suffered severe attacks of epigastric pain beginning at the age of 9 months, and occurring on the average every two or three weeks. Each attack was accompanied by profuse perspiration, constipation, dilatation of the pupils, marked increase in blood pressure and pulse rate, absence of gastric and intestinal peristalsis, and epigastric tenderness. Leukocytosis and glycosuria were also observed. The reaction to atropine and the marked sensitivity to epinephrine indicated hyperactivity of the sympathetic portion of the autonomic nervous system. Moreover, atropine and thyroid extract seemed to increase the frequency and severity of the attacks. Appendectomy at 3 years of age, and exploratory laparotomy with release of periduodenal adhesions at 10 years, failed to relieve the symptoms. On account of the evidence of increased sympathetic tonus, vagotropic medication was used. Single attacks were aborted by the administration of physostigmine (eserine) intramuscularly and pilocarpine intravenously. The daily oral administration of pilocarpine in small doses was followed by complete relief from symptoms. The possible significance of functional disturbances of the vegetative nervous system in so-called gastric neurosis is considered.

Unilateral Edema in Infant Aged Four Months.—A case of unilateral edema in a girl, aged 4 months, is reported by Leopold and Rogatz. It is concluded that the most probable cause was a maldevelopment of the sympathetic nervous system supplying the whole left side of the body. This is believed to be the first case of this nature to be reported.

American J. Obstetrics & Gynecology, St. Louis

19: 457-612 (April) 1930

*Radiation and Surgical Treatment of Carcinoma of Body of Uterus. W. P. Healy and M. Cutler, New York.—p. 457.
*Pregnancy and Tuberculosis. H. L. Barnes and L. R. P. Barnes, Wallum Lake, R. I.—p. 490.
*Dry Labor. C. C. Norris, Philadelphia.—p. 500.
Corpus Luteum and Menstrual Cycle Together with Correlation Between Menstruation and Implantation. C. G. Hartman, Baltimore.—p. 511.
*Carcinoma of Female Genital Tract in Childhood. A. H. Morse, New Haven, Conn.—p. 520.
Technic of Detailed Study of Seminal Cytology. G. L. Moench, New York.—p. 530.
Shortening of Transverse Diameter of Superior Strait. H. Thoms, New Haven, Conn.—p. 539.
Sodium Amytal in Treatment of Late Toxemias of Pregnancy. J. H. Moore, Grand Forks, N. D.—p. 544.
*Endocervicitis Treated with New Type of Actual Cautery: Ninety Cases. H. W. Baker and G. S. Miles, Boston.—p. 548.
Diathermy in Gynecology. G. Kolischer, Chicago.—p. 550.
Pregnancy in Bicornuate Unicollis Uterus with Child Occupying Both Horns. J. J. Gill, Chicago.—p. 553.
Uterus Bicornis Unicollis with Atresia and Hematometra of One Horn. W. H. Grant and D. Rose, Boston.—p. 555.
Status Epilepticus Following Normal Labor: Case. N. R. Kretzschmar, Ann Arbor, Mich.—p. 557.
Climacteric Bladder Irritability. F. Lindenberg, Los Angeles.—p. 562.

Radiation and Surgical Treatment of Carcinoma of Body of Uterus.—An analysis of 100 cases has convinced Healy and Cutler that the prognosis in cases of fundus carcinoma by partial hysterectomy may be rendered favorable by prompt irradiation of the cervical stump. Three out of five patients so treated have remained well over five years. Inoperable fundus carcinoma, including cases in which the operation offers technical difficulty, is best treated by radiation alone, the results to be expected depending on the extent of the

disease, the radiosensitivity of the tumor and the adequacy of the radiation. In the highly radiosensitive type a cure in a small percentage of advanced cases may be expected. Intrauterine irradiation is the method of choice in the treatment of papillary adenoma malignum. In the other three histologic types, irradiation alone and combined irradiation and hysterectomy have yielded approximately similar results. The combined results in eighty-two cases of operable fundus carcinoma treated by irradiation alone show 58.5 per cent cures. These results compare favorably with the best statistics in the surgical treatment of this disease and demonstrate that the prognosis of fundus carcinoma may be at least as good by irradiation as by surgical methods. The decision between irradiation and operation in operable fundus carcinoma must for the present depend on the circumstances in each individual case, such factors as histologic type, technical operability, stage of disease, general or constitutional and local complications being taken into account.

Pregnancy and Tuberculosis.—The Barneses analyzed 410 cases and concluded that a woman with active tuberculosis should avoid pregnancy in order that she may be spared the extra work and worry of a baby, and that the baby may be spared the risk of infection. The problems of tuberculosis and pregnancy need further clinical research, but the data obtained from this series of 410 pregnant tuberculous women suggest that pregnancy in itself has a harmful influence, if at all, in only a small percentage of cases and that abortion, being unnecessary in most favorable and futile in most unfavorable cases, is rarely beneficial to tuberculous women. About 81 per cent of the tuberculous women who became pregnant and who were not subjected to therapeutic abortion bore normal children. A policy which would sacrifice all these children on the apparently slight and still unproved chance of saving the mothers is not easy to justify.

Dry Labor.—Norris reiterates that the treatment of dry labor should be essentially conservative and that operative delivery should be reserved for those cases in which it is especially indicated. Complications are more frequent than in normal cases, and these should be carefully guarded against and met by appropriate treatment as they arise. A dry labor is essentially a complicated labor and can be treated most advantageously in a well equipped maternity hospital.

Carcinoma of Female Genital Tract in Childhood.—Morse reports a case of adenocarcinoma originating in the glandular structures of the cervix in a girl, aged 10. The first diagnosis made was gonorrheal vaginitis.

Endocervicitis Treated with New Type of Actual Cautery.—Ninety patients with subacute and chronic endocervicitis have been treated by Baker and Miles by cauterization. About 86 per cent were cured; 12 per cent were improved, and 2 per cent (one) remained unimproved.

American Review of Tuberculosis, Baltimore

21: 587-709 (May) 1930

Origin of Fibrous Tissue Arising in Testis of Guinea-Pig Following Experimental Tuberculosis. G. A. Baitsell and K. E. Mason, Nashville, Tenn.—p. 593.
*Treatment of Intestinal Tuberculosis with Cod Liver Oil and Tomato Juice. M. McConkey, Ray Brook, N. Y.—p. 627.
*Treatment of Laryngeal Tuberculosis with Trichloracetic Acid. B. Katz. —p. 636.
*Calcium Chloride in Prevention of Pleural Effusions in Artificial Pneumothorax. L. Boonshaft, San Jose, Calif.—p. 640.
*Bronchial Asthma and Pulmonary Tuberculosis. J. Harkavy and S. Hebald, New York.—p. 644.
*Focal Infections Among Tuberculous Simulating Tuberculous Disease. J. C. Bryant, Oak Terrace, Mich.—p. 653.
Influence of Postural Changes on Râles. J. E. K. Flannagan, Trudeau, N. Y.—p. 659.
Influence of Colds on Pulmonary Tuberculosis in Patients Undergoing Treatment. F. H. Heise, Trudeau, N. Y.—p. 664.
*Diminution in Circulation of Skin Factor in Decreasing Cutaneous Tuberculin Reaction. J. D. Pilcher, Cleveland.—p. 669.
*Costa Reaction. H. S. Penn, Duarte, Calif.—p. 684.
*Closed Tuberculosis in Children. V. Mikulowski, Warsaw, Poland.—p. 686.
Postsanatorium Histories of Tuberculosis Cases. J. S. Whitney and B. A. Myers.—p. 691.
Plan of Attack on Tuberculosis. H. E. Kleinschmidt.—p. 702.

Treatment of Intestinal Tuberculosis with Cod Liver Oil and Tomato Juice.—The addition of cod liver oil and tomato juice to the ordinary hospital diet was found by McConkey to be adequate treatment for intestinal tuberculosis complicating pulmonary disease. The method is simple, inexpensive and without contraindications. It is at least as effective as artificial heliotherapy. It is useful in the after-care of irradiated patients who would otherwise be unable to continue treatment at home. The method may prove a means of preventing intestinal tuberculosis in many cases. Three ounces of tomato juice is placed in a glass about half the size of an ordinary tumbler. On the surface is floated one-half ounce (a large tablespoonful) of cod liver oil. The whole is served ice cold immediately after meals. The patient should be told that slight gaseous eructations savoring of cod liver oil may be experienced for the first week or so of treatment but that they will not be noticeable afterward. Several biologically tested cod liver oils have proved satisfactory. The tomato juice may be prepared by passing the contents of an ordinary can of tomatoes through a sieve, and several reliable firms market the strained juice in cans ready to serve. Either product is suitable but will ferment even in the ice box if kept longer than twenty-four to forty-eight hours after the can is opened. The juice of an average sized orange is entirely satisfactory as a substitute for the 3 ounces of tomato juice in homes where fermentation cannot be avoided.

Treatment of Laryngeal Tuberculosis with Trichloracetic Acid.—During twenty years of personal experience with the use of crystals of trichloracetic acid in laryngeal tuberculosis, Katz has felt the need of an exact method of introducing the crystals into the larynx and has worked out what he has found to be a safer method of application by means of a shallow spoon shaped container with a sliding cover, which can be opened and closed. One or two crystals are introduced into the container and locked there. The larynx is anesthetized with 10 per cent solution of cocaine and the closed instrument is introduced into the larynx to the affected part and the container opened, allowing the acid to cover the affected area. By this technic the healthy tissue is spared from being burned by the acid. The patient can attend to his business, the treatments being repeated every fourth or fifth day. The advantage of the trichloracetic acid in laryngeal tuberculosis lies in its ease of application, the checking of the pain and edema in a few treatments, the absence of inflammatory reaction, and the universally good results in cases which are not hopeless from a general point of view. Trichloracetic acid can be easily applied to those points of the larynx which can hardly be reached by the electrocautery. In pharyngeal and laryngeal tuberculosis of the ulcerative and edematous type, trichloracetic acid has to be considered a specific. When tuberculomas are present in the larynx, they should be gradually melted away by repeated electrocauterization, with subsequent applications of trichloracetic acid. It has to be stressed, however, that laryngeal tuberculosis is a process secondary to pulmonary tuberculosis, reflecting the primary disease in its manifestations. Therefore, if the patient's pulmonary tuberculosis is becoming progressively worse, the treatment of laryngeal tuberculosis is not encouraging with any method, though pain can be relieved with trichloracetic acid even in hopeless cases. In favorable cases it requires from two to six months to arrest the disease, depending on the individual involvement. In some cases in which the sputum is positive, relapses occur and treatments must be repeated.

Calcium Chloride in Prevention of Pleural Effusions in Artificial Pneumothorax.—In the past year Boonshaft has administered calcium chloride intravenously throughout the early part of the treatment of fifteen cases, and has found only one case in which a small amount of fluid developed in the pleura. He gives 5 cc. of a 5 per cent solution of calcium chloride intravenously, three times a week, for a period of four or five weeks, and then reduces the number of injections to two a week, for four or five weeks, and then to once a week for the same length of time. During all this time the patient is frequently examined by the fluoroscope to determine whether fluid

is forming in the pleura. Calcium chloride given intravenously does not produce any ill effects if given slowly and in not too concentrated solution. The patients usually have a sensation of warmth about the face and neck and sometimes throughout the entire body. Great care must be exercised in giving calcium chloride intravenously, as tissue necrosis will occur if it gets outside the veins.

Bronchial Asthma and Pulmonary Tuberculosis.—In examining the protocols of 400 cases of bronchial asthma, Harkavy and Hebald found forty cases in which there was clinical and roentgen evidence of pulmonary tuberculosis. All of these patients were ambulatory, and only eighteen of the forty attended the clinic with sufficient regularity to be studied. Of the eighteen, seventeen showed chronic fibrotic tuberculosis with cavitation. The sputum of only three was positive for tubercle bacilli at some time before they came to the asthma clinic. Of these eighteen patients, nine proved to be insensitive and nine were found to give evidence of protein hypersensitiveness by means of skin tests. Six of these were studied by means of passive-transfer experiments and were found to have reagins in their serum for some of the proteins to which they were susceptible. All in the protein-sensitive group were freed of asthmatic attacks by removal of the offending proteins. The conclusion therefore seems reasonably justified that foreign proteins of the inhalant group and not the tubercle bacillus were responsible for the asthma in this group. Nine sensitive patients gave evidence of having foci of infection, six having chronic sinusitis, two bronchiectasis, and one a chronic focus of organized pneumonia. The asthma in this group is therefore to be ascribed to the complicating respiratory infection and not to the tubercle bacillus. This group of patients has done well during the summer months. In the winter they are subject to recurrent "colds," to which, in spite of operations on the sinus, they are not completely immune. In the authors' hands operative procedure in the presence of chronic hyperplastic sinusitis has been of no value whatever. Only patients with frank pus in their sinuses have derived any benefit from operative intervention. Climatic change has been of the greatest value.

Focal Infections Among Tuberculous Simulating Tuberculous Disease.—Of 3,127 patients examined, Bryant says practically all have required dental attention. Oral foci, numbering from one to all of the teeth, have been removed in 80 per cent of the patients examined. Those studied have for the most part suffered from arthritis not complicated by tuberculosis. The devitalization of teeth for any cause whatever is heartily protested against and condemned. It should at the most be regarded only as an emergency measure. Early prophylactic care would mean much in the prevention of future trouble, and if more stress is laid on prevention, extraction will not be necessary. The prolonged retention of devitalized teeth is regarded as the direct or contributory etiologic factor and primary focus in an untold number of ills. Modern bridgework and denture construction render void any possible excuse for the further retention of dead teeth.

Diminution in Circulation of Skin Factor in Decreasing Cutaneous Tuberculin Reaction.—Evidence is presented by Pilcher that in the human tuberculous subject, accompanying a decrease in weight as the infection progresses, there is a decrease in tuberculin sensitivity, in extreme cases even to 10 mg. of tuberculin intracutaneously, as well as to a nonspecific irritant. This decrease in reactivity is considered to depend, in part at least, on lessened circulation in the skin and subcutaneous tissue.

Costa Reaction.—Penn feels that the Costa reaction should be looked on as an important adjunct to laboratory procedures and should be interpreted in the light of clinical observations. It must never be relied on as a short-cut for the diagnosis of pulmonary tuberculosis. It cannot be used as a criterion for the determination of the degree of activity. Even its negative results are of questionable value.

Closed Tuberculosis in Children.—The observation of Fränkl, Krause, Emerson and Rosenberger that the tubercle bacilli found in the feces in cases of "closed" lymphatic tuberculosis are of biliary origin is confirmed by Mikulowski. The presence of these bacilli in the bile is a result of more or less intense bacillemia, which may be present in cases of lymphatic and osseous tuberculosis.

American J. Roentgenol. & Rad. Therapy, New York

23: 353-468 (April) 1930

Clinical Value of Roentgen Ray in Diagnosis of Cardiovascular Disease. P. D. White, Boston.—p. 353.
Uncoiled Aorta: Normal Aorta. D. S. Dann, Kansas City, Mo.—p. 358.
Standardization Roentgenologic Study of Heart and Great Vessels in Left Oblique View. G. H. O'Kane, F. D. Andrew and S. L. Warren, Rochester, N. Y.—p. 373.
Roentgenologic and Pathologic Findings in Valvular Lesions. D. Steel, Cleveland.—p. 384.
Clinical and Roentgenologic Study of Aorta: Syphilitic Aortitis. A. O. Hampton and T. D. Jones, Boston.—p. 390.
Value of Roentgenologic Study of Esophagus and Bronchi in Cases of Heart Disease, Especially Mitral Disease. R. Paterson, Toronto, Canada.—p. 396.
Injuries Resulting from Irradiation in Beauty Shops. H. H. Hazen, Washington, D. C.—p. 409.
Phytobezoar in Stomach: Case. J. D. Camp, Rochester, Minn.—p. 413.
Primary Carcinoma of Left Breast Associated with Early Metastatic Involvement of Right Scapula: Case. J. O. Bower and H. A. K. Mengle, Philadelphia.—p. 415.

Maine Medical Journal, Portland

21: 51-73 (April) 1930

Diagnosis and Treatment of Gastric and Duodenal Ulcer. J. R. Hamel, Portland.—p. 53.
Rationale of Gastric Surgery. C. M. Robinson, Portland.—p. 55.
Is Doctor in Rural Districts Doomed to Extinction? H. L. Irish, Turner.—p. 56.

Michigan State M. Soc. Journal, Grand Rapids

29: 337-410 (May) 1930

Sinus Thrombophlebitis. D. R. Heetderks, Grand Rapids.—p. 337.
Pathology of Nasal Sinuses. C. G. Wencke, Battle Creek.—p. 341.
Perforating Injuries of Eye by Small Steel Fragments. H. L. Begle, Detroit.—p. 345.
Essentials of Hearing Tests. R. Sonnenschein, Chicago.—p. 351.
*Simplified Method of Controlling Diabetes Mellitus. A. C. Curtis and M. M. Harrington, Ann Arbor.—p. 355.
*Chewing Tobacco Responsible as Source of Sugar in Certain Diabetics. H. B. Schmidt, Detroit.—p. 365.
Ocular Manifestations of Diabetes. L. F. Carter, Detroit.—p. 365.
New Medical Reserve Camps. H. R. Carstens, Detroit.—p. 367.
Prophylaxis and Treatment of Lobar Pneumonia. D. W. Fenton, Reading.—p. 369.
Michigan's Department of Health. G. L. Kiefer, Lansing.—p. 372.

Simplified Method of Controlling Diabetes Mellitus.—Curtis and Harrington describe the routine treatment of diabetes mellitus with the diets that have been used successfully in the University of Michigan Hospital for the past ten years. Many of the fundamentals necessary for the successful treatment of diabetes mellitus are incorporated in these diets.

Chewing Tobacco as Source of Sugar in Certain Diabetic Patients.—Schmidt asserts that he has seen nine patients suffering from severe diabetes who, in spite of low carbohydrate diets, still excreted sugar without accountable cause. Two of these patients were in the hospital under the strictest supervision and became quite a puzzle until it was discovered that they were using approximately 2 ounces of chewing tobacco a day. On investigation it was found that sugar would appear or disappear from the urine as tobacco was chewed or withheld. Further investigation showed that of samples of tobacco examined, the sugar content varied in different brands used and sometimes in the same brand examined. All the patients were questioned in regard to swallowing tobacco juice and they all denied that they did so voluntarily.

Military Surgeon, Washington, D. C.

66: 613-777 (May) 1930

Graduate Study of Morbid Anatomy by Military Surgeon. L. B. Wilson.—p. 613.
Report on Fifth International Congress of Military Medicine and Pharmacy, London, England, May, 1929. W. S. Bainbridge.—p. 629.
Skin Sensitivity to Parthenium Hysterophorus: Case. S. W. French.—p. 673.
Control of Measles in Army. E. B. Maynard.—p. 677.
Tuberculosis and Its Control: II. Laboratory Diagnosis of Tuberculosis. H. J. Corper.—p. 681.
Ainhum. H. P. Makel.—p. 693.
Days Gone By. J. Cochran.—p. 696.

Missouri State M. Assn. Journal, Fulton

27: 203-260 (May) 1930

Address on Occasion of Eightieth Birthday of Dr. William H. Welch. E. Sachs, St. Louis.—p. 203.
Hemoptysis in Mitral Stenosis: Two Cases, One with Fatal Hemorrhage. A. M. Ginsberg, Kansas City.—p. 205.
Management of Difficult Head Presentation. W. L. Clapper, St. Louis. —p. 209.
Prenatal Care. J. D. Van Cleve, Malden.—p. 212.
Conduction of Normal Labor. P. Baldwin, Kennett.—p. 217.
Postnatal Care. E. J. Nienstedt, Blodgett.—p. 220.
Factors of Chronicity in Peptic Ulcer. J. W. Larimore, St. Louis.—p. 221.
Human Infection with Yeastlike Fungi: Laboratory Diagnosis. R. S. Muckenfuss, St. Louis.—p. 229.
Diabetes Insipidus and Water Intoxication. H. A. Bulger, St. Louis. —p. 232.

Nebraska State Medical Journal, Norfolk

15: 177-216 (May) 1930

Electrocardiographic Interpretation. J. C. Thompson, Lincoln.—p. 177.
Cardiologic Cases. A. D. Dunn, Omaha.—p. 184.
General Surgery Under Spinal Anesthesia: Personal Experiences. J. E. Summers, Omaha.—p. 186.
Goiter: Case Studies. A. Brown, Omaha.—p. 190.
Injuries to New-Born During Birth and Treatment. E. M. Hansen, Lincoln.—p. 193.
Chronic Empyema: Cases of Chronic Empyema. C. Emerson, Lincoln. —p. 197.
Proposed Narcotic Legislation. J. W. Duncan, Omaha.—p. 200.
Progress. G. O. Remy, Ainsworth.—p. 202.
Dermatologic Clinics. A. Schalek, Omaha.—p. 204.

New Orleans Medical & Surgical Journal

82: 735-826 (May) 1930

Medical and Surgical Aspects of Goiter. C. F. Dixon, Rochester, Minn. —p. 735.
*Use of Dried Brewers' Yeast in Treatment and Prevention of Pellagra. P. S. Carley, Belzoni, Miss.—p. 740.
Symposium on Infections of Liver and Subphrenic Space: I. Etiology and Diagnosis of Suppuration In and About Liver. J. H. Musser, New Orleans.—p. 745.
Id.: II. Radiologic Signs of Subdiaphragmatic Abscess. A. Granger, New Orleans.—p. 748.
Id.: III. Surgical Treatment of Subphrenic Infections. A. Ochsner, New Orleans.—p. 752.
Diagnostic and Prognostic Blood Indications. L. S. Lippincott, Vicksburg, Miss.—p. 761.
Home Treatment of Diabetes. S. Harris, Birmingham, Ala.—p. 769.
Significance and Limitations of Radiogram in Diagnosis of Oral Sepsis. S. L. Tiblier, New Orleans.—p. 776.
Spinal Analgesia in Abdominal Surgery. A. B. Carney, Clarksdale, Miss.—p. 779.
Bacillary Dysentery in Louisiana. D. N. Silverman, New Orleans.—p. 782.
Intestinal Diverticulosis. J. H. Smith, Jr., New Orleans.—p. 784.
Postpartal Care. W. E. Levy, New Orleans.—p. 788.
Voice Without a Larynx. H. DuPuy, New Orleans.—p. 791.
Purpura Hemorrhagica in Pregnancy. H. R. Shands, Jackson, Miss. —p. 792.
Surgical Diseases of Pancreas. I. M. Gage, New Orleans.—p. 795.

Use of Dried Brewers' Yeast in Treatment and Prevention of Pellagra.—The results of the treatment of 176 cases of pellagra with dried brewers' yeast, in doses of 1 ounce a day in Negroes in Humphreys County, Mississippi, since Aug. 1, 1927, are detailed by Carley. One patient died during treatment; 104 had suffered no relapses in eleven months after fifty days of treatment; 33 cases showed symptoms of relapse within one year after slightly under fifty days of treatment, and 38 special cases kept on daily doses averaging about three-fourths ounce the year round showed no relapses after an average of thirteen months of observation.

Radiology, St. Paul

14: 317-444 (April) 1930

Fewer Variable Factors in Roentgen Therapy. A. W. Erskine, Cedar Rapids, Iowa.—p. 317.
Analgesic Effects of Roentgen Rays. J. Borak, Vienna.—p. 328.
Development of Dosimetry. E. Lorenz, Cambridge, Mass.—p. 340.
Erythema and Tolerance Doses in American Clinics. O. Glasser and U. V. Portmann, Cleveland.—p. 346.
Roentgen Erythema of Human Skin: III. Macroscopic and Skin Capillary Changes After Combined Exposure to Roentgen Rays and Ultraviolet Rays. E. A. Pohle and C. S. Wright, Madison, Wis.—p. 351.
Halogenated Oils Employed in Roentgenology. D. L. Tabern, N. A. Hansen, E. H. Volwiler and L. A. Crandall, Chicago.—p. 364.
Precise Measurement of Roentgen Dosage. L. S. Taylor, Washington, D. C.—p. 372.
Effective Versus Sphere Gap Voltages. A. Mutscheller, New York.—p. 385.
Effect of Technic on Speed of Intensifying Screens. F. E. Swindells, Towanda, Pa.—p. 387.
Mesenchymatous Tumors of Lung and Pleura. I. Pilot, Chicago.—p. 391.
Determination of Radiation Values in Lung Tissue with Variable Qualities of Radiation. J. L. Weatherwax and C. Robb, Philadelphia.—p. 401.
Roentgen Therapy in Acute Inflammatory Conditions. E. A. May, Newark, N. J.—p. 411.

South Carolina M. Assn. Journal, Greenville

26: 77-116 (April) 1930

Allergy: Relation to General Medicine. H. M. Davison and M. I. Lowance, Atlanta, Ga.—p. 88.
Importance of Fundus Oculi in Consideration of General Vascular Disease. J. W. Jervey, Greenville.—p. 94.
Charles Blum Geiger, an Appreciation. W. S. Harvin, Manning.—p. 99.
Other Observations of Mine. G. P. Neel, Greenwood.—p. 99.
Frequency of Mastoiditis in Infants. F. C. Helwig and O. J. Dixon, Charleston.—p. 100.

Surgery, Gynecology & Obstetrics, Chicago

50: 783-928 (May) 1930

*Bone Changes in Hyperparathyroidism. E. L. Compere, Chicago.—p. 783.
Postoperative Pulmonary Complications and Bronchial Obstruction. P. N. Coryllos, New York.—p. 795.
Experience with Sodium Amytal as Intravenous Anesthetic. J. T. Mason and J. W. Baker, Seattle.—p. 828.
Diverticulitis of Colon. F. W. Rankin and P. W. Brown, Rochester, Minn.—p. 836.
Malignant Tumors of Nail Bed: Case of Subungual Melanoblastoma. R. H. Jaffé, Chicago.—p. 847.
*Absorption and Transference of Particulate Material by Great Omentum. G. M. Higgins and C. G. Bain, Rochester, Minn.—p. 851.
*Postconception Pelvic Irradiation of Albino Rat (Mus Norvegicus): Effect on Offspring. D. P. Murphy and M. D. Renyi, Philadelphia. —p. 861.
*Circulatory Complications of Prostatectomy. E. C. Andrus and E. P. Alyea, Baltimore.—p. 864.
*Simple, Nonspecific Ulcer of Colon. M. E. Barron, Boston.—p. 870.
*Theory and Practice of Intra-Uterine Charcoal Treatment in Gynecology and Midwifery. H. Nahmmacher, Mainz, Germany.—p. 873.
Local Anesthesia in Abdominal Surgery. A. W. Wishnjewsky, Kasan, U. S. S. R.—p. 879.
Operative Treatment of Ununited Fracture of Neck of Femur. R. Whitman, New York.—p. 885.
*Use of Iodized Oil (Lipiodol and Iodipin) in Diagnosis of Joint Lesions. P. H. Kreuscher and H. Kelikian, Chicago.—p. 888.
*Operative Treatment (Trendelenburg) of Embolism of Lungs: Three Cases. A. W. Meyer, Berlin, Germany.—p. 891.
*Prolapse of Intestine Through Preformed Opening in Great Omentum. K. H. Martzloff, Portland, Ore.—p. 899.
Median Colostomy. L. J. Hirschman, Detroit.—p. 903.
*Implantation Malignancy of Abdominal Wall. H. Dvorak, Minneapolis. —p. 907.

Bone Changes in Hyperparathyroidism.—A case of osteomalacia is reported by Compere in which a diagnosis of hyperparathyroidism and tumor of the parathyroid gland was made and confirmed at operation. A second parathyroid was excised and found to be normal. Symptomatic improvement was noted following removal of the parathyroid adenoma. A summary of eleven other cases which have points of similarity and which have been recently described is presented.

Absorption and Transference of Particulate Material by Great Omentum.—Studies have been made by Higgins and Bain on the degree of absorption by the isolated omentum from the subcutaneous pouch at frequent intervals, ranging from thirty minutes to forty-eight hours after an injection. Lymphatic vessels within the omentum have not been demonstrated conclusively and yet absorption from this organ is essentially by way of the lymphatics of the diaphragm and the mediastinum. It was not possible to demonstrate either free particles or graphite-laden histocytes in the omental blood vessels, following an injection into the subcutaneous pouch. Following phagocytosis of the graphite particles by active mobile histocytes, these cells accumulate along the blood vessels and pass toward the gastric and splenic attachments of the great omentum. The routes of drainage from the distal part of the omentum follow essentially the mesothelial lining of the lesser peritoneal sac. From the gastroliental ligament, drainage follows around the dorsal surface of the stomach, along the lesser omentum to the caudate lobe of the liver, and thence along the coronary ligament

of the liver and the central tendon of the diaphragm to the anterior mediastinal lymph nodes.

Postconception Pelvic Irradiation of Albino Rat.—The litters of thirty-four female albino rats, irradiated when pregnant, have been studied by Murphy and Renyi. In five of these thirty-four litters, one or more young exhibited either clubbing of the feet or absence of the toes. The frequency with which defective young were produced appeared to vary directly with the degree of exposure. The deformities observed among the young of animals irradiated when pregnant have not been duplicated in a series of 125,000 nonirradiated control animals.

Circulatory Complications of Prostatectomy.—Proper preoperative care, the use of caudal anesthesia and careful postoperative observation have been found by Andrus and Alyea to do much toward avoiding circulatory complications of prostatectomy.

Simple, Nonspecific Ulcer of Colon.—A case of simple, nonspecific ulcer of the colon which perforated is reported by Barron. The gross and histologic characteristics of this ulcer seem to be analogous to those of peptic ulcer, and therefore the question arises whether an ulcer occurring on the colon is not a local manifestation of the same general disease that causes peptic ulcer. There was nothing in the past or present history of this patient that would suggest the cause to be mechanical, such as a decubital ulcer due to constipation.

Theory and Practice of Intra-Uterine Charcoal Treatment in Gynecology and Midwifery.—Nahmmacher uses pencils of granulated charcoal, measuring 3 and 5 cm. in length and about 4 to 5 mm. in thickness, in cases of infected abortion, before or after clearing out, according to the condition of the patient; in cases of puerperal endometritis—not before the seventh day of the puerperium, and prophylactically, in cases of cesarean section after rupture of the membranes. He says that the intra-uterine application of charcoal is completely free from danger, the medicament is cheap, and the period of illness is greatly shortened. The symptoms are instantaneously influenced, never for the worse. The body responds with an immediate improvement in the patient's general condition and in the local process, with a fall in temperature and in the pulse rate.

Use of Iodized Oil in Diagnosis of Joint Lesions.—Kreuscher and Kelikian have injected iodized oil into the knee joint and the hip joint for diagnostic purposes, and beneficial clinical effects have also been derived from these injections in the majority of cases.

Operative Treatment of Embolism of Lungs.—Meyer has modified the classic Trendelenburg operation by avoiding incision of the pleura. The artery is reached by opening the pericardium. He covers the pulmonary artery clip with gauze instead of rubber.

Prolapse of Intestine Through Preformed Opening in Great Omentum.—There were no outstanding symptoms of obstruction in Martzloff's case. In fact, the preoperative diagnosis was pyelitis with a possibility of appendicitis. At operation, the appendix proved to be normal, but a loop of intestine lay on the anterior aspect of the omentum. Inspection revealed two openings in the omentum in about the midline, a smaller and a larger one. A loop of small intestine protruded through the larger defect. Reduction was easily accomplished. The margins of the two omental apertures showed no evidence of hemorrhage or fibrin deposition. They were smooth and covered with a pale gray, glistening, and translucent serosa—evidently preformed defects of undetermined age.

Implantation Malignancy of Abdominal Wall.—Dvorak reports a case in which, during the excision of an intraperitoneal malignant tumor, implanation into the abdominal wall occurred. Fifteen years after the patient's first operation, a tumor was removed from the abdominal wall which proved to be an adenocarcinoma. Following roentgen-ray and radium treatment, the patient survived for more than five years. At necropsy metastases were seen in the spine (fourth and fifth lumbar vertebrae), but no source for the abdominal wall tumor masses was found.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Bristol Medico-Chirurgical Journal, London

47: 1-96 (Spring) 1930

Duty of Medicine to Race. C. F. Walters.—p. 1.
Hospitals—Voluntary or Self-Supporting? R. J. A. Berry.—p. 19.
*Infective Factor in Thrombosis and Embolism. A. W. Owen.—p. 29.

Infective Factor in Thrombosis and Embolism.—Thirty-two cases are reported by Owen in support of his assertion that any variety of embolism may occur during or after influenzal attacks. The embolism, though often occurring in subjects of heart disease, occurs not infrequently in healthy and robust subjects. The explanation that will account for embolism in healthy subjects and also for all varieties of embolism is an increased coagulability of the blood. The postoperative embolisms, whether pulmonary or systemic, are in many cases similar to the influenzal, and there is good reason for stating that they occur at the same seasons and that their numerical incidence varies directly with the prevalence of influenza. Thrombosis in the pulmonary veins is probably an important factor in the production of the systemic emboli which occur in patients with sound hearts.

British Journal of Radiology, London

3: 149-196 (April) 1930

Association of Radium and Roentgen Rays in Treatment of Malignant Disease. J. E. A. Lynham.—p. 150.
Mecapion: An Ionization Apparatus for Absolute Measurement of Roentgen Dose. E. J. H. Roth.—p. 155.
*Relative Value of Radium and Roentgen Therapy in Malignant Disease. N. S. Finzi.—p. 161.
Use and Abuse of Radium Needles. F. L. Hopwood and F. E Smallman.—p. 165.
New Hot Cathode Tube with Rotating Anode. W. R. Gray.—p. 171.
Intensity Relations. S. Russ.—p. 178.
Pneumopyopericardium and Radiologic Diagnosis. J. F. Brailsford.—p. 180.
Improved Radium Needle Filter. R. J. Reynolds.—p. 186.

Relative Value of Radium and Roentgen Therapy in Malignant Disease.—Finzi concludes that the individual case and the skill of the operator determine the treatment to be employed and what the results will be. He says that in the case of radiosensitive growths the employment of the roentgen ray is the treatment of choice every time. This applies even when they invade the skull. With small growths of a type which tends to remain localized, radium should be used every time. The classic example is the rodent ulcer. Other cases are the small epithelioma of the skin and intrinsic epithelioma of the larynx. In cases with a high radioresistance, radium will usually be a better treatment, if surgery or diathermy is inapplicable. However, by increasing the time factor, many of these cases may be brought under control with either roentgen rays or radium, with daily or almost daily applications for five or six weeks. Even cases which have been treated for many years by radium or the roentgen rays or both have shown healing. Radium is the preferential method. The position of the growth also plays an important rôle. In growths in the region of the mouth and upper air passages (including the pharynx and hypopharynx), the best results have been obtained either by roentgen rays alone or by a combination of roentgen rays and radium. Radium alone may be used in some cases, needles for the local growth and a radium collar for the neck. Good early results have been obtained by implanting seeds in the local growth and by a radium barrage of seeds or needles in the neck, but it is unlikely that such radiation will be homogeneous enough, and it has been shown that most of the growths recur. In growths of the cervix, radium for the local growth and roentgen rays for the gland areas give good results. In rectal carcinoma radium seems to be more effective than roentgen rays. In carcinoma of the breast radium needles have proved effective, but there are many cases for which they will not be suitable. If the mediastinum is involved, roentgen rays must be used. Roentgen rays alone, a radium plaque, made up with wax, alone, or a combination of the two has also proved effective in a number of cases, but the doses must be large.

British Journal of Surgery, London

17: 573-726 (April) 1930

Epoch-Making Books in British Surgery: XII. Sir Astley Cooper's Treatise on Dislocations and Fractures. D. Power.—p. 573.
Common Duct Stones of Liver Origin: Eight Cases. K. H. Digby.—p. 578.
*Duodenal Diverticulosis. P. N. B. Odgers.—p. 592.
*Lesion Common to Breast and Prostate Glands. G. L. Cheatle and R. S. Wale.—p. 619.
Surgery of Undescended Testis: Twenty-Four Cases. H. Tyrrell-Gray.—p. 623.
Roentgen Diagnosis of Right Paraduodenal Hernia. J. Taylor.—p. 639.
Diaphysectomy and Primary Suture for Acute Osteomyelitis of Fibula. H. Bailey.—p. 641.
*Treatment of Carcinoma of Rectum with Radium. C. Gordon-Watson and C. Dukes.—p. 643.
Congenital Nonrotation of Intestine. R. H. Mole.—p. 670.
Fat Necrosis of Breast. G. Hadfield.—p. 673.
*Malignant Tumors. O. W. Roberts.—p. 683.
Double Tongue: Case. S. J. H. Griffiths.—p. 691.
Aneurysm of Splenic Artery. R. S. L. Brockman.—p. 692.
Middle Cerebral Embolism Following Partial Thyroidectomy for Graves' Disease. L. Rogers.—p. 694.
Persistent Hematuria from Minute Papilloma of Renal Pelvis. J. C. Anderson.—p. 696.

Duodenal Diverticulosis.—The classification of diverticula suggested by Odgers is: (*a*) primary pouches, found without any apparent cause and confined to the second, third and fourth parts of the duodenum; (*b*) secondary pouches, which are always due either to chronic duodenal ulcers or to the traction of adhesions and occur only in the first part, and (*c*) vaterine pouches, associated with the biliary papilla.

Lesion Common to Breast and Prostate Glands.—Cheatle and Wale call attention to a connected sequence of pathologic events in the prostate that corresponds to a similar sequence of events in a certain disease of the breasts known under the misleading term of "chronic cystic mastitis." In the breast the disease can be seen passing from one stage into another with complete consistency when all the stages of the lesion occur. The stages in the breast are as follows: First, there is a cystiphorus desquamative epithelial hyperplasia that ends in shedding dead cells and the formation of large and small cysts; the process may end here. Second, there is a transformation of the cystiphorus desquamation into epithelial neoplasia; the cells are all viable and capable of multiplication: this condition may remain benign; papillomatous formations are a marked feature of this stage. Third, the epithelial neoplasia may pass on to carcinoma. Cheatle and Wale have noticed indications of the same course of events occurring among the specimens examined of the prostate.

Treatment of Carcinoma of Rectum with Radium.—Gordon-Watson and Dukes discuss their experiences in the treatment of ninety-three cases of cancer of the rectum with radium during the past five years. In certain instances it has been demonstrated that (1) an early growth on the anterior wall of the rectum can be destroyed by needling through the vagina, and the rectum at the site of growth can be restored to its normal appearance and caliber; (2) a similar result can be secured by the introduction of seeds directly into a small growth without colostomy; (3) a large fixed inoperable growth can be destroyed by perineal irradiation, with a resultant fibrous stricture, and the patient remain well (four years); (4) an inoperable high growth can be apparently cured by abdominal radiation and remain well (two years), and further, a colostomy is not always essential; (5) a fixed inoperable growth can be rendered operable; (6) a perineal recurrence can be made to disappear; (7) in the worst and most advanced cases the patients can be made more comfortable by relief of symptoms. The author says: Until we are in a position to measure the action of radium with some accuracy, to be able to say with confidence that a given dose of radium administered in a given way for a given time will produce a certain result, we are, I think, in duty bound to advise surgery, mutilating though it is, in preference to radium for the operable case. When, however, as sometimes happens, the growth is operable but the patient is considered unsuitable for radical surgery on other grounds, I believe radium holds out great though uncertain prospects of cure and should always be employed when available.

Malignant Tumors.—The importance of mechanical and infective conditions associated with malignant tumors is emphasized by Roberts. The lymphatic system not only offers a path for dissemination of the tumor cells but also tends to localize the malignant cells within its own boundaries. There is a dorsal lymphatic system which plays an important part in the spread of carcinoma cells and which may be responsible for widespread dissemination.

British Journal of Tuberculosis, London

24: 61-112 (April) 1930

Aspects of Treatment of Tuberculosis Under Metropolitan Asylums Board. M. C. Wilkinson.—p. 61.
*Results of Treatment of Laryngeal Tuberculosis at Vejlefjord Sanatorium, Denmark. O. Strandberg and J. Gravesen.—p. 67.
Classification and Treatment of Hemoptysis in Pulmonary Tuberculosis. G. T. Hebert.—p. 71.
Tuberculin Testing of Graded Herds of Cows. R. E. Glover.—p. 75.
Schemes for Employment of Tuberculous Patients. J. B. McDougall.—p. 79.

Results of Treatment of Laryngeal Tuberculosis at Vejlefjord Sanatorium, Denmark.—Strandberg and Gravesen are convinced that combined treatment of the tuberculous lesions in the lung and larynx under sanatorium conditions is a method of choice. The statistics that they have given will be of service for comparison. The combined treatment gives a percentage of cures 30 points higher than in cases in which special treatment has been carried out for only the laryngeal complication. The authors stress the value of cooperation between a phthisiologist and a laryngologist in sanatorium work, and strongly advocate the adoption of this course in all cases of tuberculosis in which there are both pulmonary and laryngeal lesions.

British Medical Journal, London

1: 727-768 (April 19) 1930

Relation of Medicine to Surgery in Treatment of Gastric and Duodenal Ulcer. C. Bolton.—p. 727.
Harelip and Treatment. G. B. Warburton.—p. 732.
Excretion Urography. K. Heritage and R. O. Ward.—p. 734.
*Hinged Bone Graft. A. K. Henry.—p. 737.
Fractured Pelvis: Four Cases. N. H. Lindsay.—p. 738.
Chloretone Poisoning. H. S. N. Menko.—p. 739.
Auto-Blood-Transfusion. T. Gray.—p. 739.
*Hyperpyrexia in Measles. E. V. Brown.—p. 739.

Hinged Bone Graft.—Henry has employed hinged grafts, made from osteoperiosteal strips implanted into bony grooves cut in the back of each malleolus, and extending on either side of the foot to a point just beyond the midtarsal articulation, in two kinds of case: (1) for patients with calcaneovalgus deformity due to paralysis; (2) for complete foot drop or "dangle-foot." Before grafting, any fixed deformity in the paralyzed foot must be corrected by manipulation or tenotomy.

Hyperpyrexia in Measles.—Brown reports that in a case of measles occurring in a child, aged 2 years, the temperature went up to 110 F., the limit registered by the thermometer.

Lancet, London

1: 897-946 (April 26) 1930

Significance to Clinical Medicine of Calcium and Phosphorus Metabolism. D. Hunter.—p. 897.
Pressure Caused by Abdominal Tumors. G. W. Theobald.—p. 904.
*Radiation Therapy in Cancer. A. T. Todd.—p. 906.
Angina Pectoris and Coronary Disease. D. Hubble.—p. 908.
*Significance of Sweating in Man. Y. Kuno.—p. 912.
Congenital Rhabdomyoma of Heart: Case. G. Brown and J. Gray.—p. 915.
Multiple Congenital Skeletal Deformities Causing Congenital Scoliosis: Case. H. L. Rees.—p. 916.
Treatment of Arterial Calcification. V. Mladejowsky.—p. 917.

Radiation Therapy in Cancer.—Todd feels that irradiation affects the cancer cell adversely, probably by inhibitory action on mitotic division, and thus prevents the continuity of the cancer process. It is here considered that this immediate action may be less important than, or even be produced by, the mediate action of irradiation which takes place: (1) locally in the junction tissue, a stimulation of its defense; (2) generally in those parts of the mesoblastic tissues which are con-

cerned with defense mechanisms, especially certain cells of the blood and the cells of the reticulo-endothelial system. Acceptance of these views will entail further modification of radiation technic in the direction of smaller doses applied for longer times, or at repeated intervals, and also greater screenage.

Significance of Sweating in Man.—With respect to the causation of sweating as well as to their distribution on the body surface, human sweat glands are classified by Kuno into two groups. 1. The sweat glands present on the palms and the soles have the characteristic of permanent secretion and react with an increased secretion to mental or sensory stimulation but not to a rise in temperature in the environment. 2. The sweat glands distributed all over the remaining parts of the body surface show little or none of this permanent secretion or "insensible perspiration." They are not responsive to moderate mental stimulation, but profuse sweating occurs from them when the temperature of the environment rises. One phenomenon is, however, common to these two different sets of sweat glands—i. e., every sweating, whenever it occurs, appears universally over its own respective district and is never confined to any single part in its area. Kuno designates the sweating from the former set of sweat glands as "mental or psychic sweating" and that from the latter as "thermal sweating."

Annales de Médecine, Paris

27: 105-236 (Feb.) 1930

Liver Treatment as Proof of Independence and Pathogenic Unity of Pernicious Anemia. L. Syllaba and V. Jedlicka.—p. 105.
Physiopathology of Hyperhemolysis. F. Bezançon, A. Jacquelin and A. Cayla.—p. 113.
Myeloid Leukemia: Splenolymphatic Syndrome. P. Emile Weil and P. Isch-Wall.—p. 124.
Blood Changes as Result of Liver Therapy in Pernicious Anemia. N. Fiessinger and C. M. Laur.—p. 132.
*Agranulocytosis in Course of Antisyphilitic Treatment. C. Aubertin and R. Lévy.—p. 151.
Agranulocytosis. E. Benhamou.—p. 165.
Use of Epinephrine in Hemorrhage and Diseases of Blood. R. Benda.—p. 190.
Eosinophilia During Asthma. F. Bezançon and E. Bernard.—p. 204.

Agranulocytosis in Course of Antisyphilitic Treatment.—In antisyphilitic treatment with arsphenamine preparations, complications have occurred which have resulted in agranulocytosis. Aubertin and Lévy obtained twenty-eight such cases from a review of the literature, fifteen of which were in women and thirteen in men. The various types of the disease could be demonstrated clearly. In all cases the onset was characterized clinically by symptoms of intolerance to the drug. There were likewise in some cases a concurrent ulcerative sore throat or hemorrhagic symptoms with globulysis. Although some authors hold an infective bacterial agent responsible in the etiology of the disease, Aubertin and Lévy point to the toxicity of some of the arsphenamine preparations. There furthermore appears to be an individual predisposition toward such manifestations.

Archives Franco-Belges de Chirurgie, Brussels

32: 89-180 (Feb.) 1930

Artificial Pneumothorax Preliminary to Thoracotomy in Free Pleural Cavity. J. Arce and Ivanissevitch.—p. 92.
Intraperitoneal Closure of Fistulas. P. Duval and H. Welti.—p. 101.
*Diagnosis of Pancreatic Cysts. E. Delannoy and P. Razemon.—p. 107.
*Perforated Ulcers Treated by Excision and Pyloroplasty. L. Grimault.—p. 124.
Posterior Subacromial Dislocation of Shoulder. G. Dardel.—p. 139.
Old Dislocation of Left Shoulder Complicated by Multiple Fracture of Greater Tubercle. P. Nicod.—p. 163.

Diagnosis of Pancreatic Cysts.—In the differential diagnosis of the two types of pancreatic cysts which are recognized in the literature, Delannoy and Razemon point out that the development and evolution of the cysts is of greater importance than the physical or functional manifestations. The so-called false cysts arise suddenly and may be due to a trauma; they show rapid but irregular development. In the true pancreatic cysts the onset is insidious and the evolution is slow and gradual. There are certain exceptions to this rule in which, however, differential diagnosis is impossible. The authors discuss the clinical histories of four patients in whom the characteristics mentioned are demonstrated.

Perforated Ulcers Treated by Excision and Pyloroplasty.—Grimault reports the results of his personal experience in fourteen patients in whom gastric and pyloric perforations occurred and in whom surgical intervention was successful. One patient had cancer, which had caused the perforation into the peritoneal cavity; it was closed with the aid of an epiploic fold. In two other patients simple suture of the perforation was done. Gastropylorectomy was indicated in a fourth patient. In ten patients excision and subsequent pyloroplasty were done. This method is indicated in severe late conditions, when a rapid completion of the intervention is necessary, or if simple suture or burying of the perforation by a purse-string suture cannot be done. Grimault points to the importance of careful choice of the operative method and advises excision with pyloroplasty only if other methods appear unfavorable. The only difficulty in this operation may be encountered through the lack of mobility of the duodenum, which was noted in two patients. One of the greatest advantages of the method is that the operation is limited to a comparatively small area which prevents spreading of an infection. It is important to make an extensive resection so that the sutures can be laid in healthy tissue.

Journal de Chirurgie, Paris

35: 161-320 (Feb.) 1930

*Fractures of Spine of Tibia. H. Costantini and Conniot.—p. 161.
Abdominoperineal Amputation of Rectum. A. Ricard.—p. 177.

Fractures of Spine of Tibia.—Costantini and Conniot discuss the etiology, mechanism, treatment and prognosis of these injuries on the basis of the literature and of five cases, four of which were their own. In three patients operations were done, with good results in two and improvement of the condition in the other. As a general rule the treatment should first be an orthopedic one, unless the nature of the injury is such that immediate operation is indicated. The authors do not advise the placing of a metal screw in fixation or of any foreign body. The causes of such fractures are usually indirect; they may be due to tearing loose of the medial tubercle and the anterior cruciate ligament.

Lyon Chirurgical, Lyons

27: 1-136 (Jan.-Feb.) 1930

*Indications for Cholecystogastrostomy. L. Bérard and P. Mallet-Guy.—p. 5.
Ruptures of Spleen, Especially Those Complicated by Rupture of Left Kidney. R. Desjacques.—p. 17.
Nature of Kümmell's Disease. R. Leriche.—p. 27.
*Thrombus of Iliac Vein Found in Left External Iliac Artery. E. Dahl-Iversen.—p. 39.
Luxation by Rotation of Axis. E. Dahl-Iversen.—p. 43.

Indications for Cholecystogastrostomy.—On the basis of their personal experience in many patients, Bérard and Mallet-Guy state that cholecystogastrostomy does not invariably result in drainage of the gallbladder. Bile can at times be excreted intermittently and often obliteration of the duct ensues. The authors do not favor this operation as a means for obtaining without fail modification of the gastric contents. Cholecystogastrostomy, however, does insure internal deviation of the flow of bile and is indicated in icterus due to retention. The most frequent indication is given in cancer of the pancreas, but the operation is also indicated in patients having tumors of the bile ducts. In chronic pancreatitis of undetermined origin, and likewise in stasis of the gallbladder, the operation of choice is cholecystogastrostomy. The operation is not advised in stricture of the bile ducts, in patients with tuberculous lymph nodes of the omentum or in idiopathic dilatation of the bile duct in children. In chronic cholecystitis without lithiasis, and as a rule in infections of the gallbladder, cholecystogastrostomy is contraindicated. The "legitimate" indication for the operation is determined by a mechanical obstruction of the bile duct; it is not solely a means for obtaining deviation of the bile.

Thrombus of Iliac Vein Found in Left External Iliac Artery.—Dahl-Iversen reports this unusual occurrence in a woman, aged 53, who was suffering from phlebitis. Examination of the heart and aorta did not show any abnormalities. The patient had had varicose veins for several years without,

however, showing any discomfort up to the onset of the phlebitis about one week previously. Several days after her admission to the clinic the pain in her left foot increased, and she was unable to move the toes or her ankle or to raise her foot. The foot and leg were cold and pulsation could not be felt up to the distal part of the femur. The diagnosis of an embolus in the left femoral artery was made and arteriotomy appeared indicated. The incision was extended up to the inguinal region, as the artery was without pulsation and did not contain any blood. Below the ligament a small incision was made in the artery and an embolus of about 10 cm. in length was removed. A temporary ligature was placed above the incision and the opening in the artery sutured. There was no hemorrhage after removal of the ligature and pulsation was gradually restored. Five days later, although a slight feeling of numbness persisted, the color and temperature of the skin of the left leg appeared normal. The symptoms of bilateral phlebitis disappeared after two months of treatment and the patient did not show any signs of cardiac involvement. Careful examination of the specimen disclosed that it was a thrombus which had originated in one of the diseased veins and had passed into the arterial system through a patent foramen ovale.

Presse Médicale, Paris

38: 281-296 (Feb. 26) 1930

*Syringomyelia: Roentgenotherapy. Delherm, Morel-Kahn and Desgrez.—p. 281.
Rôle of Bony Structure in Fractures of Skull. G. Jeanneney and C. Wangermez.—p. 284.
Antisyphilitic Immunity. G. Ichok.—p. 285.

Syringomyelia: Roentgenotherapy.—From a review of 159 cases obtained from the literature and their personal experience in fifteen patients, Delherm et al. conclude that this treatment is successful if applied at an early stage of the disease. Other treatment is by no means contraindicated and it is especially in congenital syringomyelia that the best results have been obtained. An essential factor in this therapy is irradiation of an area extending far beyond the apparent involvement of the spinal cord. Control of the patient should be maintained over a protracted period, and it is important to examine the skin carefully and guard against injury from the frequent irradiations. Of 159 patients, 124 were reported improved to such an extent that in many one might speak of recovery. This favorable result in 79 per cent warrants further use of roentgenotherapy.

Revue Française de Gynécologie et d'Obst., Paris

25: 81-176 (Feb.) 1930

Rupture of Extra-Uterine Pregnancy. P. Bégouin.—p. 81.
Engagement of Fetal Head in Primiparas. J. Andérodias and R. Mareille.—p. 87.
Hemorrhages of Corpus Luteum. J. Guyot and J. Villar.—p. 95.
*Low Cesarean Section in Treatment of Hemorrhages Due to Placenta Praevia. P. Balard.—p. 110.
Retroplacental Hemorrhages. P. Balard and R. Mahon.—p. 133.
*Syndrome of Rupture of Extra-Uterine Pregnancy. G. Jeanneney and Rosset-Bressand.—p. 156.

Low Cesarean Section in Treatment of Hemorrhages Due to Placenta Praevia.—Balard reviews the results obtained within the last few years at his clinic in the treatment of forty-eight women in whom hemorrhage due to placenta praevia occurred during labor. In preference to the older obstetric methods, he favors low cesarean section, which should be done after rupture of the fetal membranes. Of thirty-six women who were treated by obstetric therapy, six died (mortality of 16.66 per cent). In twenty-five instances death of the fetus was reported. The fetal mortality was therefore about 69 per cent, although six children were below 2 Kg. in weight and not viable, and one subsequently died. Although it is generally accepted that the prognosis of placenta praevia is more serious in primiparas, it was noted that the fatal cases occurred in multiparous women. In twenty-five cases treated within the last three years, obstetric methods were employed in thirteen and two deaths ensued. In the twelve women in whom low cesarean section was done, the result was good. Spinal anesthesia is favorable, although in patients in whom an extensive hemorrhage has already occurred general anesthesia with ether is advised, as it has a hypertensive action. Injections of hypophyseal extract and ergot preparations should be associated with the treatment.

Syndrome of Rupture of Extra-Uterine Pregnancy.—Jeanneney and Rosset-Bressand point out that rupture of an extra-uterine pregnancy need not necessarily be accompanied by acute pain and the usual classic symptoms. The clinical histories of two patients are described, in one of whom the rupture had occurred several hours previously and was accompanied by only a slight pain in the pelvic region. However, the patient gradually showed symptoms of internal hemorrhage and laparotomy was done, disclosing the presence of more than 3 liters of blood in the abdominal cavity. The right uterine tube was ruptured and still bleeding. Attempted retransfusion of blood was not successful, but salpingo-oophorectomy was done and the patient subsequently recovered. The other patient had acute pain; three hours later operation disclosed an enlarged uterine tube with a small hematoma near the broad ligament which was ecchymotic. There was very little blood in the pelvic cavity. Salpingo-oophorectomy was likewise done and rapid recovery ensued.

Archivio Italiano di Chirurgia, Bologna

25: 469-576 (Feb.) 1930

Periureteral Sympathectomy. L. Caporale.—p. 469.
Carcinosarcoma of Thyroid, with Retrosternal, Suffocative Development. S. Rolando.—p. 502.
Anatomicopathologic and Clinical Study of Traumatic Lesions of Kidney. A. Romani.—p. 505.
Neoplastic Hepatic Cyst: Case. M. Einaudi.—p. 520.
*Anaphylaxis in Relation to Gastric Ulcer. D. Vallone.—p. 535.
*Resection of Presacral Nerve: Type of Intervention to be Preferred in Certain Pelvic Disorders. C. Chianello.—p. 566.

Anaphylaxis and Gastric Ulcer.—Vallone's experiments on rabbits and dogs were undertaken to control the reported observations of Demel. The antigen employed was horse serum. For the first experiments a commercial serum was used; later, a serum freshly prepared by the author. The experimental lesions developing in the animals sensitized to horse serum differed in intensity according to the species. The dogs were sensitized less easily, but the shock phenomena noted in them were more grave than those observed in the rabbits. In the rabbits cachexia frequently resulted from the serum, from which many died during the experiments, which extended over periods of fifty days or more. With irradiated fresh horse serum, the shock symptoms were more grave and the lesions of the stomach walls more marked than those produced by normal horse serum. The lesions produced in the gastric walls of the sensitized animals heal more slowly than those of the controls. The author was unable, however, to obtain ulcerations of the stomach wall on the site of the artificial lesions maintained for a long time in the animals sensitized to horse serum, and thus did not secure experimental confirmation of the theory of Demel, according to which an ulcer forms in a subject sensitized to a given antigen as a result of the appearance in the gastric mucosa of an enduring lesion produced by foreign bodies, through which the same sensitizing antigen, introduced with the food, is absorbed.

Resection of Presacral Nerve in Certain Pelvic Disorders.—Chianello approves Cotte's division of pelvic pains into two classes: (1) those located in the uterus, anus, coccyx and bladder, being due to an excitation of the hypogastric plexus, and (2) those that present a lumbar or obturator repercussion and are due to changes in the spermatic plexus. In class 1, resection of the presacral nerve may be indicated, and in class 2, resection of the utero-ovarian plexus. The author reports in detail his own case in a married woman, aged 30. He would have given preference to bilateral resection of the utero-ovarian plexus if he had been able to discover in advance that the severe pains associated with irregular menses were due to sclerocystic ovaritis, but, as it was, he chose rather to resect the presacral nerve because of the presence of adhesions, the result of chronic salpingitis, which surely contributed greatly to the symptoms of pain. The patient's severe and diffuse pains disappeared immediately following the intervention, but there

remained a slight constant pain in the right ovary, which was merely resected, a pain that found a conduction path in the right spermatic plexus. This fact shows that when it is desirable to preserve a portion of the ovary, the seat of the pain, it is good practice to add resection of the utero-ovarian plexus (Ruggi) of the corresponding side.

Chirurgia degli Organi di Movimento, Bologna

14: 505-608 (March) 1930

Diffuse Osteoplastic Carcinosis of Skeleton Due to Clinically Unknown Primary Carcinoma of Prostate. V. Putti and G. Faldini.—p. 505.
Congenital Malformations and Osteodystrophies of First Metacarpal Bone. A. Montanari.—p. 530.
Renal Pseudorachitism. R. Zanoli.—p. 539.
Arthroplasty with Sutured Strips of Aponeurosis. M. Dainelli.—p. 555.
*Volkmann's Contracture. F. E. Godoy Moreira.—p. 573.
Osteogenic Exostoses and Bone Deformities. G. Ricciuti.—p. 583.
Genesis of Movable Bones in Joints of Synovial Origin. O. Bartoli.—p. 594.
Fracture of Capitellum of Humerus. D. Vallone.—p. 607.

Bone Shortening for Volkmann's Contracture.—Godoy Moreira discusses solely the problem of surgical treatment. The particular conditions of the bone and the muscles, the development of the various components of the deformity, and considerations of an esthetic nature are factors determining the preference for one or the other operation. In a patient with disturbances of ossification, processes of bone rarefaction or poorly consolidated fractures located in the forearm, or in a case in which the shortening is considerable, it is evident that one will not resort to the operation based on skeletal shortening. On the other hand, in a case in which the forearm presents eschars or cicatricial adhesions of the flexor tendons, the plastic lengthening of these tendons will be avoided. At times, the combination of two or more of the operations described will be indicated to bring about the correction of the contracture. The author describes the technic that appears to offer the best outlook in skeletal shortening, the principal points being: (1) division of the ulna and radius at different levels, the radius more proximally and the ulna more distally; (2) plastic resection in such a manner that the apposition of the ends of the ulna is made in the frontal plane and of the ends of the radius in the sagittal plane; (3) hypercorrection, and (4) early mobilization.

Policlinico, Rome

37: 429-464 (March 24) 1930. Practical Section

Pathologic Symptoms of Right Abdomen. S. Solieri.—p. 429.
*Echinococcus Infection of Prostate. F. Graziani.—p. 432.
Technic of Appendectomy. G. Rocca.—p. 436.

Echinococcus Infection of Prostate.—Graziani points out that echinococcus infection of the prostate is very rare, especially the primary form. He treated a case of multiple diffuse primary echinococcus infection with hepatic, prostatic and para-ureteral localization. Although most authors recommend the perineal route at operation, Graziani holds that, when the cyst is frankly palpable at the hypogastrium, as well as at the rectum, the preferable method is a laparotomy, a perineal counter opening, at the most, being added. He describes the technic of this process. It is possible thus to enucleate instead of marsupialize the prostatic cyst, together with any other intrapelvic cysts that may be present.

37: 53-100 (Feb. 15) 1930. Surgical Section

Primary Sarcoma of Descending Colon and of Sigmoid Flexure. M. Fanucci.—p. 53.
Pathogenesis and Treatment of Gastro-Enterocolic Fistulas. N. La Gravinese.—p. 66.
*Modes of Resorption in Experimental Hydronephrotic Kidney. A. Vitale.—p. 84.

Modes of Resorption in Experimental Hydronephrotic Kidney.—In studying the mode of resorption of various substances in hydronephrosis, Vitale produced experimentally in dogs and in rabbits a total or subtotal occlusion of the ureter and, either at once or after a certain interval, injected substances into the pelvis. From his experiments, it appears that these substances may be absorbed by the lymph nodes, the collecting and convoluted tubules, and the venous route. The second mode of resorption begins to function two or three days after the onset of the hydronephrosis. If, however, pelvic hyperpressure develops, there is at once absorption by way of the tubules.

Riforma Medica, Naples

46: 317-356 (March 3) 1930

Clinical and Experimental Researches with Duodenal Sound. G. Pennetti.—p. 319.
*Effects of Resection of Vagus on Gastric Secretion. G. Pieri and U. Tanferna.—p. 323.
*Irritation and Trauma in Genesis of Tumors. E. Fiorini.—p. 326.
Apparatus for Automatic Application of Paraffin: Apparatus for Staining of Histologic Sections. G. Gianturco and C. Gianturco.—p. 331.

Effects of Resection of Vagus on Gastric Secretion.—Pieri and Tanferna's study was carried out on nine persons with hypersthenic dyspepsia or with recurring gastric ulcer. In six, supradiaphragmatic resection of the left vagus had been performed; in three, bilateral resection of the vagus under the diaphragm. The results of these operations were controlled with the Ewald test meal and with histamine. During the weeks that followed the operation, the authors observed a notable lowering of the hydrochloric acid and of the pepsin, the decrease being more conspicuous in the cases in which the resection had been bilateral. Later, the hydrochloric acid and also the pepsin content rose steadily, and in some cases regained and even exceeded the previous figures.

Irritation and Trauma in Genesis of Tumors.—Fiorini, in support of the theory of the irritative and traumatic genesis of tumors, describes three clinical cases: (1) a seminoma that arose on an ectopic and atrophic testis a short time after an operation for scrotal orchidopexy and homolateral inguinal hernia; (2) a fibromyxoma that developed along the course of a fistula due to osteomyelitis of old standing, and (3) an adenocarcinoma that developed on a laparotomy scar.

Archiv für klinische Chirurgie, Berlin

158: 543-763 (April 4) 1930

*Surgery of Elephantiasis. H. Kuntzen.—p. 543.
*Circumscribed Cystic Myositis Ossificans. K. Makrycostas.—p. 584.
*Surgical Treatment of Gastroptosis: Results. R. Ollenstein.—p. 611.
Occult Epigastric Hernia. P. N. Napalkow.—p. 627.
*Pathology and Treatment of Umbilical Hernia. K. Mészáros.—p. 650.
*Horse Hair as Suture Material. M. S. Ass.—p. 664.
*Osteosynthesis with Horn Plates and Catgut. E. Dahl-Iversen.—p. 680.
*Tumor Formation Resulting from Roentgen Irradiation of Tuberculous Joints. H. Hanke and C. Neuhaus.—p. 685.
Tumors of Mesentery: Granuloma of Fatty Lymph Node. R. Fleischmann.—p. 692.
Changes in Blood Vessels in Cases of Cold Gangrene. M. Hellmuth.—p. 702.
Protracted Postoperative Dilatation of Arterioles of Skin. J. Ipsen.—p. 713.
*Treatment of Infections of Urinary Tract by Increasing the Acidity of the Urine. K. Kelsted and E. Schiödt.—p. 719.
*Peritoneal Adhesions. O. Diebold.—p. 737.
Symptomatology of Dislocations of Elbow Joint. E. Orbach.—p. 758.

Surgery of Elephantiasis.—Various methods of operating are reviewed by Kuntzen, whose method of choice, however, is that of Payr. He points out that final results can be reported only after the lapse of many years, because early favorable results are too frequently converted into late unfavorable results. Payr's operation is shown to be a successful one, even though it does not lead to a complete cure in very many cases. For instance, of sixteen patients with elephantiasis of the leg, only two were cured, six were much improved, four were only slightly improved and three had recurrences (one not traced). In cases in which the genitalia were involved, remarkably good results were obtained with this method. In cases of secondary elephantiasis, a cure was always effected. Kuntzen also reports the results of some experimental work on animals. He found that a mechanically produced lymph stasis was never followed by edema, even when the tissues which ordinarily play a not inconsiderable rôle in the regeneration of lymph circulation were severely traumatized. Handley's method of drainage with silk threads proved to be quite effective for a time. The drainage is not through the silk thread, as has been supposed to be the case: the thread is surrounded by a very thin newly formed sheath of connective tissue and the lymph circulation takes place in the space between this wall and the thread. After about forty-five days, this passage becomes impassable to lymph and the silk threads have no more drainage value.

Circumscribed Cystic Myositis Ossificans.—Makrycostas states that in rare cases a hematoma of muscle is not converted

into a pigmented scar and then the end-result is a cystic myositis ossificans, surrounded by a shell of bone and cartilage. Thus organization and shrinkage of the hematoma do not take place; the blood vessels are destroyed, and there results tissue destruction and finally a cyst. The fibrin contained in a hematoma promotes its organization; the serum prevents it. The age of the patient is not a deterrent nor does it slow up the process. The author defines myositis ossificans as being neither a tumor nor an inflammatory process, but a local, indirect, metaplastic hyperplasia of unknown etiology. Not only the connective tissue of the muscle is concerned in the process but also the extraperiosteal connective tissue, all fascia, ligaments and tendons, and fat tissue—all tissues derived from the same embryonal structures. The myositis ossificans may secondarily unite itself with the bone. If the process took origin in the preperiosteal tissue, the union is, of course, a primary one, but care must be taken in differentiating a primary from a secondary union. One must keep in mind that bone may be formed by muscular connective tissue just as well as by periosteal tissue.

Surgical Treatment of Gastroptosis.—Ollenstein reports forty-three cases in which the operation of Hosemann, a modification of the Perthes-Vogel method, was performed. The ligamentum teres hepatis is bisected at its umbilical end and freed throughout its length down to its insertion into the liver, care being taken to conserve its blood supply as much as possible. A Perthes tunnel, about 2 or 2.5 cm. in length, is made. It extends from the right side of the pylorus along the edge of the lesser curvature of the stomach. The ligament is drawn through this tunnel and the free end is passed on through the peritoneum, the abdominal rectus muscle and its anterior sheath, and is anchored firmly immediately under the skin of the abdomen. In its passage through the Perthes tunnel the ligament is fastened by several Lembert sutures in such manner as to cause a slight puckering of the stomach wall. Thus the stomach is not only raised up but is made smaller. The end-results after three and four years could be determined in twenty-seven cases. A cure was effected in twenty-two cases; improvement took place in four, and no result was reported in only one case. Three women became pregnant and did not suffer any complications.

Congenital Umbilical Hernia.—Mészáros objects to the term hernia funiculi umbilicalis (hernia umbilicalis congenita) on the ground that it is incorrect from both the embryologic and the pathologic standpoints. He prefers the term "coeloma funiculi umbilicalis persistens." The immediate cause of this condition he believes to be a disproportionate space in the lesser pelvis which causes a high degree of backward bending of the fetus. Thus is prevented the necessary sagittal spreading of the abdominal cavity; the muscular wall of the abdomen is closed and the organs that develop in the coelom are excluded from the abdomen. The dangerous possibilities are peritonitis and ileus, hence immediate operation is indicated in these cases. The operation must be a radical one, performed as for any incarcerated hernia.

Horse Hair as Suture Material.—Ass expounds the many good qualities of horse hair as a suture material. It was used by East Indian surgeons as early as the fourteenth century. He prefers the hair of Russian horses to any other and by comparison points out its great superiority over imported material. In the Traumatological Institute in Leningrad the hair is tied into small bundles. These bundles are scrubbed thoroughly in hot water with green soap. Then they are dried. Thereafter they are washed in benzene, alcohol or ether. This is followed by boiling in sterile water for forty minutes, the process being repeated until the odor of "horse" can no longer be detected. The hair is kept in the dried state until ready for use. Before use it is boiled for from fifteen to twenty minutes. The author asserts that these repeated cookings greatly increase the tensile strength of the horse hair.

Osteosynthesis with Absorbable Material.—Dahl-Iversen uses plates made from horn, the size of the plate varying with the size of the bone on which it is to be used. Each plate has four grooves in which is laid the rope made of braided chromic catgut that binds the plate to the bone. These catgut ropes are used when thoroughly dry. When they are moistened by the tissue fluids, they tend to shrink and thus bind the plates closer to the bone.

Tumor of Tuberculous Elbow Joint Result of Roentgen Therapy.—Hanke and Neuhaus report the case of a man, aged 22, whose elbow joint was resected for tuberculosis when he was 5 years old. The wound failed to heal and the cervical lymph nodes became enlarged. Roentgen therapy was instituted. At the age of 17, it was apparent that the third, fourth and fifth cervical vertebrae were tuberculous and for a time he could not move his extremities. With strict rest in bed, lying in the supine position, he recovered almost entirely, but in the meantime he had developed a tumor-like mass in the resected elbow joint, which had been treated roentgenologically. For fear that it might be malignant, a complete removal was done. On microscopic examination of the tumor it was found to be a chondroplastic fibroma without any evidence of malignancy. The authors assume that the tuberculosis toxins and the roentgen ray in combination caused the new growth.

Treatment of Urinary Tract Infections by Increasing the Acidity of the Urine.—Kelsted and Schiödt report seventy cases (twenty-eight of pyelitis and forty-two of cystitis) in which acidification of the urine was effected by the administration of calcium chloride, ammonium chloride, methenamine or phenyl salicylate, with 17 per cent of cures.

Peritoneal Adhesions.—Among 700 necropsies reported by Diebold, 232 cases of peritoneal adhesions were found. Only well developed adhesions were counted. He assumes, therefore, that one third of humanity has such adhesions. The incidence becomes greater with age. It is nearly the same in the two sexes. In 106 of the cases with adhesions, no changes in any viscera were found which might have been of etiologic import. In forty-five cases sufficient reason for the development of adhesions was found, but there were no adhesions. Of the 106 cases referred to, seventy-three presented adhesions in the right upper abdominal quadrant, in the region of the duodenum and gallbladder. Only eleven showed adhesions in the appendiceal region and eleven in the lesser pelvis. Of the 126 cases of adhesions in which visceral changes were found as a possible cause, sixty-one were in the gallbladder region, twenty-two in the lesser pelvis, twenty in the gastric zone, thirteen in the region of the appendix, and ten in the duodenal zone. The author suggests that there may be a predisposition to the formation of adhesions or an inherent power to overcome them.

Deutsche medizinische Wochenschrift, Berlin

56: 511-552 (March 28) 1930

Practical Value of Nonspecific Status as Method for Determination of a Diseased Condition but not for Diagnosis of a Specific Disease. V. Schilling.—p. 511.
*Experimental Investigations on Liver Therapy. U. Friedemann and H. Deicher.—p. 513.
*Bacteriologic Observations in Psittacosis. Reineck and P. Hofmann.—p. 516.
Serologic Determination of Relationship According to Zangemeister's Method. W. Zangemeister.—p. 517.
Special Indications for Pneumothorax Treatment and for Phrenic Exeresis. H. Alexander.—p. 518.
Alkali Reserve of Blood in Neurasthenia and in Organic Nervous Diseases. F. Walinski.—p. 520.
*Influence of Administration of Bone Marrow on Anemia Caused by Loss of Blood. W. Borchardt.—p. 521.
Behavior of Calcium Content and of Sugar Content of Blood After Administration of Various Opium Preparations. H. Zahler.—p. 522.
Bacteriology of Pseudogonorrheal Vulvovaginitis in Children: Frequency of Gonorrheal Vaginal Catarrh in Children. K. W. Clauberg.—p. 524.

Experimental Investigations on Liver Therapy.—In order to determine whether rats with *Bartonella* anemia could be employed for testing liver extracts and also to investigate the mode of action of liver therapy, Friedemann and Deicher made tests on them. In experimenting with fresh liver the authors found that a liver diet influences primarily the *Bartonella* infection and the anemic process only slightly or not at all. After demonstrating the therapeutic value of fresh liver in *Bartonella* anemia, the authors tested several liver extracts. They come to the conclusion that the substance which is effective either is not present in the extracts or is present only in minor quantities. If it could be proved that in pernicious

anemia in human beings liver preparations will exert the same influence as fresh liver, this would likewise indicate that the substances in the liver which influence *Bartonella* anemia in rats are not identical with those that affect pernicious anemia. However, recent investigations by other authors have proved that fresh liver and liver extracts probably have not the same effect in the treatment of pernicious anemia. The authors conclude that as yet it cannot be definitely stated whether rats with *Bartonella* anemia are suitable test objects for liver extract.

Bacteriologic Observations in Psittacosis. — Reineck and Hofmann state that cases of psittacosis were also observed in Saxony. They report the results of bacteriologic tests on blood specimens from twenty-three patients with psittacosis and on the heart blood and on the organs of two patients who had died of psittacosis. As a culture medium bouillon, bile or agar may be used. The agar surface has to be kept moist. The authors succeeded in cultivating rod-shaped micro-organisms which are about the size of the bacteria of the paratyphoid group. However, they are more plump and some of them show plasmolysis. They are gram-negative and appear to be non-motile. On agar they form small and transparent colonies; they do not liquefy gelatin. Formation of indole is absent. They cause acid and gas formation in dextrose but not in lactose. Litmus whey becomes red after twenty-four hours, and after four days it becomes bluish. Rod-shaped micro-organisms of this type were cultivated from the blood of eleven patients and from the heart blood and the organs of the two cadavers. That this organism could not be cultivated from the blood of the other twelve patients is probably due to the fact that the blood was withdrawn after the tenth day. In all instances in which the rod-shaped micro-organism was found, the blood had been withdrawn between the second and the eighth day. Parrots which had been inoculated with patient's blood that had been withdrawn during this period contracted the disease and died. In the birds thus infected, the rod-shaped micro-organism was likewise detected. The negative bacteriologic tests of other investigators had led to the assumption that the pathogenic agent of psittacosis might be a filtrable virus. However, the authors' attempts to demonstrate a filtrable virus were not successful. They come to the conclusion that psittacosis is not caused by a filtrable virus but that the rod-shaped micro-organism which they isolated is probably the etiologic factor. Agglutination tests of this organism with immune serums of bacteria of the typhoid-paratyphoid group, of the various types of *Bacillus enteritidis*, of *Bacillus suipestifer* and of *Bacillus suis* always gave negative results. However, agglutination was positive with serums from the convalescent psittacosis patients in Saxony. Serum from a convalescent psittacosis patient in Hamburg likewise gave a positive agglutination, whereas serum from a patient in Berlin gave negative results. Blood from a parrot that had recovered from psittacosis gave a positive agglutination. Various stocks of Nocard's bacillus were not agglutinated by the serum of convalescent patients.

Administration of Bone Marrow in Secondary Anemia. —Borchardt directs attention to the fact that the action of the bone marrow is of great significance for erythropoiesis. In order to determine whether the bone marrow contains substances that aid in the regeneration of the blood, the author made experiments on dogs. About one half of their blood had been withdrawn. In addition to a mixed food, the animals in one group were given dried red marrow from the ribs. Those in another group were given marrow from the long bones. As controls they used dogs that were given either fat or a liver preparation in addition to the mixed food. In the animals which had received red marrow the increase in weight and especially in the hemoglobin content was more marked than in the dogs which had been given marrow from the long bones. In the animals that had received liver extract or fat the increase in weight was nearly the same as in the dogs which had been given marrow from the long bones. However, the increase in the hemoglobin content was considerably less. These experiments proved that the administration of red bone marrow influences regeneration of the blood most favorably. However, it was not quite clear which of the substances that are contained in the bone marrow exert this influence. The tests prove that the fat content cannot be the cause. The author further experimented with red bone marrow which for several hours had been exposed to heat. Later he employed this sterilized marrow after it had been treated with acetone-petroleum ether. In both experiments it was found that the red bone marrow had retained its regenerative influence. It remains to be proved whether peroral administration of extracts from bone marrow may influence certain forms of anemia in human beings.

Deutsche Zeitschrift für Chirurgie, Leipzig

224: 1-128 (April) 1930

*Calculus of Ureter. K. Lange.—p. 1.
*Clinical and Experimental Study of Partial and Complete Resection of Colon. E. Schneider.—p. 13.
*Blood and Lymph Vessels in Hemorrhagic Infarction of Loops of Small Intestine. A. Anten.—p. 53.
*Indications for Surgical Operations on Extrahepatic Bile Passages. B. Rosenbaum and E. Wiesen.—p. 62.
Bleeding Ulcer of Gallbladder. H. Junghanns.—p. 93.
*Intestinal Obstruction Caused by Sauerkraut. E. Seifert.—p. 96.
Primary Sarcoma of Mesentery. Matthaes.—p. 98.
Odontoma of Inferior Maxilla: Case. J. Heine.—p. 103.
Treatment of Arthritis Deformans with Chiniofon and Casein. O. Pohrt.—p. 108.
*Moistening Nerve Trunks with Alcohol as Substitute for Sympathectomy. N. N. Nasaroff.—p. 110.
*Treatment of Trifacial Neuralgia by Moistening the Carotid Artery with Eighty Per Cent Alcohol. N. N. Nasaroff.—p. 113.
Relationship Between Carcinoma and the Suprarenals. H. Flörcken.—p. 116.

Ureteral Stone.—Thirty-five cases subjected to operation are analyzed by Lange. He stresses the fact that stone in the ureter is not a rare occurrence; that it can be diagnosticated, and that its prognosis is not like that of kidney stone.

Habitual Chronic Constipation.—This study by Schneider was made primarily for the purpose of determining, first, the exact nature of constipation and, second, its treatment. He says that it should not be regarded as being always a disorder of the bowel, that is, the bowel is the seat of the disorder but not necessarily its cause. Hence, surgical intervention is indicated only when every other means of treatment has failed. When operation has been resorted to, recurrence of the constipation, not a diarrhea, should be looked for. He does not favor a total colectomy as the operation of choice. He would resect only the right or the left half.

Pathway of Travel of Intestinal Thrombi.—Anten determined experimentally that in cases of hemorrhagic infarction of the intestinal wall, the result of an ileus thrombi may reach the lung by way of the lymph vessels and be responsible for a bronchopneumonia. This finding confirms the observations made by Bergmann and Bramann.

Indications for Surgical Intervention on Extrahepatic Bile Passages.—Two hundred cases are analyzed by Rosenbaum and Wiesen. Eighty-nine of the 140 women had been pregnant. In eighteen of these the biliary disorder appeared either during the last months of pregnancy or immediately after the termination of the pregnancy. In only 155 of the 200 cases was there a history of colic, and in 120 of these gallstones were found. The typical pain in the shoulder was present in sixty-four cases. Temperature elevations were recorded in ninety-four cases. In forty-four cases the first diagnosis was "stomach trouble." There were thirty-seven deaths in the series, six from a weak heart, nine from sepsis, three from postoperative pneumonia, three from pulmonary embolism, five from peritonitis, and the remainder from five other causes, including coronary sclerosis, diabetic coma, gas phlegmon, cerebral abscess and hemoptysis with bronchiectasis. Appendicitis was not an associated disease in any case. Cholecystostomy is regarded as an emergency operation. When it was performed during the attack the mortality was 44.5 per cent; when it was performed during the interval the mortality was zero. The authors advise a wait of not more than fourteen days before operating. Kehr's incision is preferred because it is rarely followed by a postoperative hernia. Cholecystectomy performed during the interval gave a mortality of only 4.9 per cent, and in the cases in which drainage of the choledochus was done the mortality was zero. The T drainage of Kehr is not employed by the authors.

Ileus Caused by Eating Sauerkraut.—Seifert relates the case of a woman, aged 44, who had eaten an ordinary quantity of sauerkraut prepared in the usual manner and on the following day manifested symptoms of intestinal obstruction. Five years previously she had been operated on for penetrating ulcer of the stomach. A Billroth II-Reichel operation had been performed. She had complained of stomach disorders ever since. At operation, a mass of sauerkraut was found firmly lodged in the ileum about 20 cm. from the ileocecal valve. The mass was of the size of a goose egg and was not in a putrefactive state. Therefore, the ileus was of the obturator and not of the dynamic variety, which is said to be rather unique. An enterotomy was performed, the mass was removed, and uneventful recovery followed.

Moistening Nerve Trunks with Alcohol Versus Sympathectomy.—Nasaroff prefers to moisten nerve trunks concerned in trophic disorders, such as ulcer, or in neuralgias with an 80 per cent alcohol solution rather than to perform a sympathectomy. He refers especially to disorders in which the ischiadic nerve is involved. The nerve is exposed in the popliteal space and is freely bathed with the solution for 10 or 12 cm. of its length. Cessation of pain and prompt healing of ulcers is the result. In the one case of ischiadic neuralgia in which the method was employed, the pain ceased and had not returned after three months. The patient then disappeared and has not been seen again.

Treatment of Trifacial Neuralgia with Alcohol Baths.—In thirty cases of trigeminus neuralgia, Nasaroff has resorted to moistening the carotid artery with an 80 per cent alcohol solution. In every case some good effect was attained, either a marked lessening of the pain or almost complete cessation. In some cases the pain ceased while the patient was on the table; in others not until toward evening of the day of application, and occasionally not for two weeks afterward. He stresses the importance of thorough moistening of the artery even beyond its bifurcation. He feels that this method should be given preference over alcohol injection and operation.

Klinische Wochenschrift, Berlin

9: 577-624 (March 29) 1930

Pathogenesis of Rheumatism. F. Klinge.—p. 586.
Relation Between Function of Interstitial Cells of Testis and Production of Semen. M. Staemmler.—p. 593.
*Etiology of Hemorrhagic Necrosis of Pancreas. R. Holzapfel.—p. 596.
Genesis and Various Forms of Cholesteatoma. A. Lautenschläger.—p. 599.
Posttraumatic Late Apoplexy. H. Rosenhagen.—p. 601.

Etiology of Hemorrhagic Necrosis of Pancreas.—Holzapfel first reviews the recent literature on the pathogenesis of hemorrhagic necrosis of the pancreas. It is generally assumed that gallstones and other disorders of the biliary tract are the cause of this disease. The author then describes his own observations. In studying the anatomic conditions at the opening of the bile and the pancreatic ducts on fifty cadavers, he found that they were not always the same. In 60 per cent of the cases he noted that the two ducts opened separately into the same papilla; in 20 per cent of the cases they not only were separate but also opened into different papillae; in the other 20 per cent of the cases, however, the two ducts united and had a common opening into the same papilla. These observations as well as postmortem examinations on twenty-seven patients with hemorrhagic necrosis of the pancreas, in all of whom gallstones were found, convinced the author that hemorrhagic necrosis of the pancreas usually develops in cases in which the choledochus and the pancreatic duct are united and have a common opening. If in such cases the duodenal papilla is closed by a calculus, neither the bile nor the pancreatic secretion have an outlet, and the bile enters the pancreatic duct and activates the zymogens. The result of this activation is hemorrhagic necrosis of the pancreas. The circumstance that the two factors, namely, common opening of the ducts and the presence of calculi, are essential in the development of hemorrhagic necrosis, explains the fact that the disease is comparatively rare.

Medizinische Klinik, Berlin

26: 451-490 (March 28) 1930

Functional Disturbances in Vestibule of Ear and Its Sequelae: Seasickness and Its Treatment. O. Bruns.—p. 452.
*Investigations with Hunt's Acetonitrile Test, Especially in Bronchial Asthma. C. Oehme and H. Paal.—p. 454.
*Determination of Blood Sugar: Its Significance for General Practitioner. J. Jacobi.—p. 457.
Studies in Modern Ray Therapy. H. Cramer.—p. 459.
*Diagnosis of Intra-Abdominal Disorders in Patients with Mental Diseases. W. Wachsmuth.—p. 461.
Therapeutic Value of Thermal Waters in Aachen. H. van Rey.—p. 462.
Osteitis Fibrosa. Slauck and Donalies.—p. 463.
Roentgenologic Aspects of Abnormal Position of Colon. W. Hanebuth and H. Donalies.—p. 466.
Relief Roentgenograms in Examination of Stomach and Duodenum. A. Rohrbach.—p. 469.
Traumatic Venous Thrombosis on Arm. C. Oehme.—p. 472.
Endonasal Application of Insulin. H. Wassermeyer and A. Schäfer.—p. 474.

Investigations with Hunt's Acetonitrile Test, Especially in Bronchial Asthma.—Oehme and Paal describe their experiences with Hunt's acetonitrile test, which is usually employed for the diagnosis of exophthalmic goiter. In order to determine whether this reaction is specific for hyperthyroidism, the authors performed it on patients with various diseases, such as asthma, goiter without or with slight hyperthyroidism, uremia, nephritis, obesity and dwarfishness, and also on normal persons. A tabular report indicates the results of these tests. The reaction was positive in all patients with exophthalmic goiter. However, in cases with slight hyperthyroidism and with normal basal metabolism, it was usually negative. Of special interest was the observation that of seventeen patients with bronchial asthma, twelve gave a positive acetonitrile reaction. In some of these patients the test was repeated several times. The authors noted that the positive reactions concurred with bronchitis and with frequent attacks of asthma. One patient in whom the test had given positive results several times gave a negative reaction when for a long time he had been free from bronchitis and from severe attacks of asthma. The authors also investigated whether the acetonitrile reaction can be influenced by pharmacologic preparations. They noted that the administration of pilocarpine weakened the positive reaction in patients with bronchial asthma. However, in patients with exophthalmic goiter pilocarpine did not affect the positive reaction. The authors come to the conclusion that a correlation exists between hyperthyroidism and asthma.

Determination of Blood Sugar: Its Significance for the General Practitioner.—Jacobi points out that the determination of the sugar content of the blood requires laboratory facilities and considerable time. Consequently the general practitioner is not in a position to perform this test. Whenever a blood sugar test becomes necessary the patient should, at least for a short time, be sent to a hospital. After discussing the various forms of diabetes, the author concludes that in diabetic cases of minor severity it is not necessary for the physician to have a blood test performed and the patient need not be sent to a hospital. Such cases may be treated successfully without controlling the sugar content of the blood, especially since insulin therapy is usually not necessary. These minor cases generally yield to dietetic treatment. Severe cases, however, and particularly the complicated ones, require treatment in a hospital where a careful control of the blood sugar is possible. In cases of medium severity, ambulatory treatment is generally sufficient, even when insulin injections are required. But precaution is necessary, and occasionally short stays at the clinic for observation and for the purpose of performing blood sugar tests are advisable. For the correct diagnosis of renal diabetes and for cases that are refractory to insulin therapy, a stay at the hospital is absolutely necessary. In diabetic children clinical treatment is to be preferred to ambulatory treatment, because the insulin therapy has to be employed with great caution and frequent control of the blood sugar is essential.

Intra-Abdominal Disorders in Patients with Mental Diseases.—Wachsmuth found that in mentally affected persons the anamnesis often fails completely. He reports two cases of peritonitis. In one case it was caused by a trauma. In another instance an injury had been simulated, but the opera-

tion revealed that the peritonitis was the result of a perforated gastric ulcer. The author states that the symptoms of severe peritonitis may be completely absent in a person with mental disease. In cases of intra-abdominal perforation the accumulation of gas in the subphrenic cavity, which can be demonstrated in the roentgenogram, is sometimes the only reliable diagnostic aid.

Strahlentherapie, Berlin

36: 1-200 (March 22) 1930

*Biologic Action of Roentgen and Radium Rays on Metabolism of Cells. K. Adler.—p. 1.
*Struma Maligna: Radium Treatment. F. Dautwitz.—p. 32.
Cancer of Female Genitalia: Radiation Treatment. F. Voltz.—p. 51.
*Exophthalmic Goiter: Roentgen Treatment. W. Rieder.—p. 64.
*Bronchial Asthma: Roentgen Treatment. V. R. Zipperlen.—p. 88.
Prophylaxis of Inflammation by Roentgen Irradiation. S. Fukase.—p. 95.
*Wound Healing: Acceleration by Roentgen Irradiation. S. Fukase.—p. 102.
Protection of Eyes in Use of Roentgen and Radium Rays. W. Hoffmann.—p. 105.
Microscopic Changes in Late Roentgen Ulcer. B. Kelen.—p. 116.
Roentgen Dosage in Dermatology. F. Thedering.—p. 127.
Idem. G. Schulte.—p. 132.
Inflammations of Glandular Organs: Roentgen Treatment. C. Fried.—p. 161.
Roentgen Irradiation According to Method of Heidenhain-Fried. R. Epstein.—p. 170.
Exophthalmic Goiter: Roentgen Treatment. F. Bardachzi.—p. 173.
Roentgen Irradiation of Prostate in Retention of Urine. V. Schiller and W. Altschul.—p. 179.
Roentgen Treatment: Rare Indications. W. Altschul.—p. 183.
Gonorrhea in Men: Roentgen Treatment. J. Samek.—p. 188.
Brain Tumor: Roentgen Treatment. G. Steiner.—p. 193.
Emanation Therapy and Physiologic Dosage. J. Markl.—p. 197.

Biologic Action of Roentgen and Radium Rays on Metabolism of Cells.—Adler studied the metabolism of fifteen normal, nonirradiated rat testes, and of forty-eight that had been subjected to a roentgen irradiation of 600 R., fifteen to a roentgen irradiation of 2,500 R., and sixteen to a radium irradiation of 2,400 mg. element hours. He found that the roentgen and radium irradiations modified the metabolism of the cells in such a manner that it resembled the type of metabolism characteristic of malignant tumors. This observation indicates the way in which a chronic injury with small doses of roentgen or radium rays results in the production of a cancer.

Malignant Struma: Radium Treatment.—In nine of twenty-five cases of malignant struma, Dautwitz was able to prolong the life of the patient for more than three years by means of radium irradiations.

Exophthalmic Goiter: Limitations of Roentgen Treatment.—Rieder challenges Schwarz's statement that patients with exophthalmic goiter should be operated on only if the goiters are refractory to roentgen treatment. He believes that roentgen irradiation should be tried only in mild, early cases, in cases in which the condition of the patient does not permit of an operation and in cases in which the patient will not consent to an operation. All other patients should be operated on.

Bronchial Asthma: Roentgen Treatment.—Zipperlen reports the results of a follow-up study of fifty-four persons who one year or more previously had been given roentgen irradiations of the chest and spleen for bronchial asthma. He found that nine did not show improvement, fifteen had fewer and less severe attacks, fifteen had attacks only at intervals of several months, and fifteen were cured.

Wound Healing: Acceleration by Roentgen Irradiation.—To determine the effect of roentgen irradiation on the healing of wounds, Fukase made a skin incision 10 cm. long on the abdomen of fourteen young rabbits and irradiated half of the unsutured wound and its edges with roentgen rays, keeping the other half covered with sterilized lead. In all fourteen cases he noted that the irradiated half of the wound healed rapidly by first intention, whereas the nonirradiated half healed slowly by second intention. On the basis of his observations, he believes that in cases of fresh wounds in which first intention healing is desired, roentgen irradiation should be tried.

Wiener klinische Wochenschrift, Vienna

43: 385-416 (March 27) 1930

Pathology of Conditioned Reflexes. G. Katsch.—p. 385.
Differentiation Between Hepatocellular Galactosuria and Neurohormonal Galactosuria by Means of the Ergotamine-Atropine Test. S. Hirschhorn, L. Pollak and A. Selinger.—p. 390.
Biologic Action of Photechic Substances: Investigations on Biologic Action of Photechic Active Metals. O. Ried.—p. 394.
Retrogression of Calcium Deposits in Bursae. R. Pohl.—p. 397.
Type of Fever in Malariotherapy. M. Hecht-Eleda.—p. 399.
*Number of Erythrocytes in Human Blood. W. Komocki.—p. 400.
Nutrition After Resection of Stomach. H. Neuffer.—p. 401.
*Diabetes Mellitus During Childhood. R. Wagner.—p. 402.

Normal Number of Erythrocytes in Human Blood.—Komocki asserts that tests which he conducted in 1924 revealed that the number of erythrocytes in each cubic millimeter was between 5.5 and 6.6 million in healthy men and between 5 and 6 million in women. These numbers were considerably larger than the numbers that up to then had been considered normal. The author has studied the recent literature on this problem, and in a table he shows the results of a number of European and American investigators. He comes to the conclusion that it is no longer tenable to consider 5 million erythrocytes the normal number for men and 4.5 million the normal for women, because all investigators, with one exception, found numbers that were considerably larger.

Diabetes Mellitus During Childhood.—Wagner reports investigations on the hereditary character of diabetes mellitus in children. He studied the various forms and the frequency of other abnormalities in diabetic children. In several instances he noted dwarfishness. Malformations of the ribs, of the small fingers, of the patella and of the joints were likewise observed in some cases. Peculiar nodules behind the ears were an especially frequent occurrence in diabetic children. Visual disorders were also noted occasionally. In investigating the heredity of the diabetic children, the author found the familial occurrence of diabetes in many cases. He thinks that diabetes is a recessive characteristic. He also discovered that infantile diabetes usually becomes manifest during the period preceding puberty. The fact that diabetes mellitus has been noted simultaneously in uniovular twins is taken as additional evidence of the congenital character of infantile diabetes mellitus.

Hospitalstidende, Copenhagen

73: 29-56 (Jan. 9) 1930

*Aberrant Vessels of Kidney. H. Strandgaard.—p. 44.

Aberrant Vessels of Kidney.—Strandgaard asserts that these vessels are not so rare an occurrence as is commonly supposed. In most cases aberrant vessels of the kidney lead to the formation of a hydronephrosis, easily demonstrated by pyelography; they may also result in other disturbances, such as orthostatic albuminuria. In operative treatment of the kidney the aberrant vessels may cause dangerous hemorrhages.

73: 57-84 (Jan. 16) 1930

*Intra-Articular Injection of Petrolatum. V. Riemke.—p. 57.
*Spondylitis on Basis of Infection with Abortion Bacillus (Bang): Case. H. K. Lassen.—p. 64.
Rôle of Heredity in Etiology of Amaurotic Idiocy. S. Hansen.—p. 72.

Intra-Articular Injection of Petrolatum.—From clinical, roentgenologic, pathologic-anatomic and microscopic points of view, Riemke's case illustrates the pathologic changes occasionally produced by an apparently well indicated intra-articular injection of petrolatum.

Spondylitis on Basis of Infection with Abortion Bacillus (Bang): Case.—In Lassen's patient, with a history of pain and stiffness in the back for several years, symptoms of spondylitis set in two months after undulant fever. Roentgen examinations showed proliferative processes in the first and second lumbar vertebrae, developing during a period of seven months, together with destruction of the intervertebral disk. Tuberculosis and typhoid were both excluded as etiologic factors. Because of the agreement of the picture with spondylitis caused by *Bacillus melitensis* and the analogy between malta fever and undulant fever, the disorder in this case is believed to be due to Bang's abortion bacillus and is considered a local exacerbation of a preexistent spondylitis deformans, activated by the acute condition.

Increased Success . . .
A NEW WAY
to get patients to *follow your directions*

Here is bulk-and-roughage in a **new, mild, gentle,** ***form***
(no harshness whatever), ***and*** **flavored so attractively**
that not even children can resist it. See how it acts.

It is probably the *patient himself*—not incorrect diagnosis or wrong treatment—that most frequently stands in the way of a physician's maximum success in the practice of medicine.

How many more cases of chronic constipation could you relieve or cure if those for whom you prescribe more vegetables, the drinking of more water, more exercise or agar-and-oil would stick to the letter of your advice?

The fact is, there is an increasing need for methods that are *psychologically* as well as mechanically more effective in the treatment of constipation.

It was with this need in mind that the H. J. Heinz Company eight years ago began experiments to develop an especially delicious breakfast cereal which would not be in the least suggestive of a "health food", yet effective in its content of bulk and roughage. That cereal is the new HEINZ Rice Flakes—a type of food that millions like and will use regularly.

NOT A BRAN FOOD

This cereal is different from all others. It includes no bran. A highly refined cellulose—a part of rice itself—is retained in place of bran.

This cellulose is soft and fluffy, not harsh or irritant in any way.

It has great absorption power. Its volume increases *four to six times* after eating, forming one of the mildest, gentlest, yet most effective types of natural bulk and roughage known.

In conclusive test by unprejudiced authorities, all but the most stubborn cases of constipation responded to this new, attractive treatment.

FREE
Make this trial of Cellulose in this New Form

Below we offer you an easy way to try this new method entirely at our expense.

E. R. Harding, M. A., Fellow of Mellon Institute of Industrial Research, Pittsburgh, in a recent publication, says, "That cellulose is both a natural and valuable food constituent is evident. That it's practically essential is not too extravagant a claim. It is found widely distributed in nearly all natural vegetable foods. It is particularly high in celery, lettuce, cabbage, spinach and asparagus. Fruits like oranges, lemons, grapefruit and others of this type contain considerable amounts of it.

275 FORMULAE

275 formulae were created and tested and special processes invented before this unique new cereal was perfected.

Now it is ready to aid all who are interested in its new advantages—delicious flavor, high nutrition and roughage vegetable effect.

Even children want this food for itself alone—its enticing flavor and fairy-like daintiness of texture.

Of course, we do not advocate HEINZ Rice Flakes in place of vegetables in any case. But people who don't like vegetables and, therefore, do not eat enough of them are thus given a *supplemental* bulk-and-roughage in a most palatable form.

And being as natural as rice and vegetables themselves, anyone can eat HEINZ Rice Flakes daily throughout a lifetime with only good results.

You may eventually resort to HEINZ Rice Flakes in a large majority of all your cases of chronic constipation, and especially where bran-foods are too severe for certain intestinal conditions.

SEND COUPON

We want you to try HEINZ Rice Flakes to prove their value. Simply mail coupon below and we'll send, postpaid, two full size packages with no charge whatever.

We'll include interesting additional information about HEINZ Vegetable-Cellulose.

Mail This
Please check your classification below

H. J. HEINZ COMPANY
Dept. C-13, Pittsburgh, Pa.

Please send me without charge 2 full size packages HEINZ Rice Flakes with additional information about the cellulose contained therein.

☐ General Practitioner
☐ Specialist in Pediatrics
☐ Specialist in Internal Medicine

*Name*_____
*Street*_____
*City*_____
*State*_____

Manufactured solely by
H. J. HEINZ CO. • Pittsburgh, Pa.

HEINZ RICE FLAKES

CARL ZEISS

OPTICAL INSTRUMENTS

will be on exhibition at the

American Medical Association Convention

June 23 to 27

Booths Nos. 225 and 226

Pantophos Operating Lamp

Hook Suspension.....$503
Band Suspension.....$530
Trolley and Rail.....$585

Above Prices without bulbs, f.o.b. N.Y.

Microscopes
Pulfrich Photometer
Refractometers
Opto-Medical Instruments
Pantophos Operating Lamp
and other surgical equipment

CARL ZEISS JENA

CARL ZEISS, Inc.
485 Fifth Ave., New York

Pacific Coast Branch: 728 South Hill Street, Los Angeles, Calif.

Leading Manufacturers of

Artificial Limbs

in the United States

Our 119 page catalog and measuring chart sent free to physicians

(Our Leg and Arm catalogs issued separately, state which one desired. Also place of amputation.)

PERFECT FITTING GUARANTEED FROM PHYSICIAN'S MEASUREMENTS

The Winkley Artificial Limb Co.
1330 Washington Ave., North,
Minneapolis, Minn., U. S. A.

The Gastric Juice

obtained from

Living Animals

FOR TOPICAL APPLICATION

Observations of the action of gastric juice outside the body show a usefulness for a properly prepared product of this nature. An example of one of its indications is solution of necrotic and carious bone tissue.

Enzymol

is an extract of the fresh stomach tissue juice, specially designed for topical application.

It is put up in convenient vials. It requires ordinarily for use dilution with an equal volume of water; also with hydrochloric acid specially for cases in which this may be desirable—refractory tissue, large cavities, etc.

Originated and Made by

FAIRCHILD BROS. & FOSTER
New York